



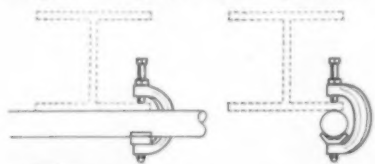
# New addition to the line of Grinnell malleable iron hangers



Grinnell's Malleable Iron G Clamp Hanger is a new addition to the line of Grinnell Pipe Hangers and Supports, the most complete line of any manufacturer. This hanger answers a long-felt need for support of pipe or conduit (up to 4 inches in size) where application can be made directly under structural steel.

The saddle of the Grinnell G Clamp swivels. This permits pipe or conduit to be installed either parallel or traverse to the beam axis. Separate beam clamp, rod and pipe clamp are not required, thus saving cost of supports and installation time.

Grinnell G Clamps are made of malleable iron with a ribbed design for added strength. The set screw has a hardened steel cup point for clamping rigidly to beam. Full thread engagement is provided by the tapping through the upper jaw. Approved by Factory Mutual Laboratories for use on fire protection and plumbing systems. Especially recommended for hanging conduit. Maximum recommended loads are from 210 to 450 pounds, for the smallest to the largest sizes, with a safety factor of 5.



Saddle swivels, permitting suspension of the pipe or conduit at any angle in a plane parallel to the face of the supporting flange.



Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors

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## Every Grinnell Malleable Iron Hanger offers . . .

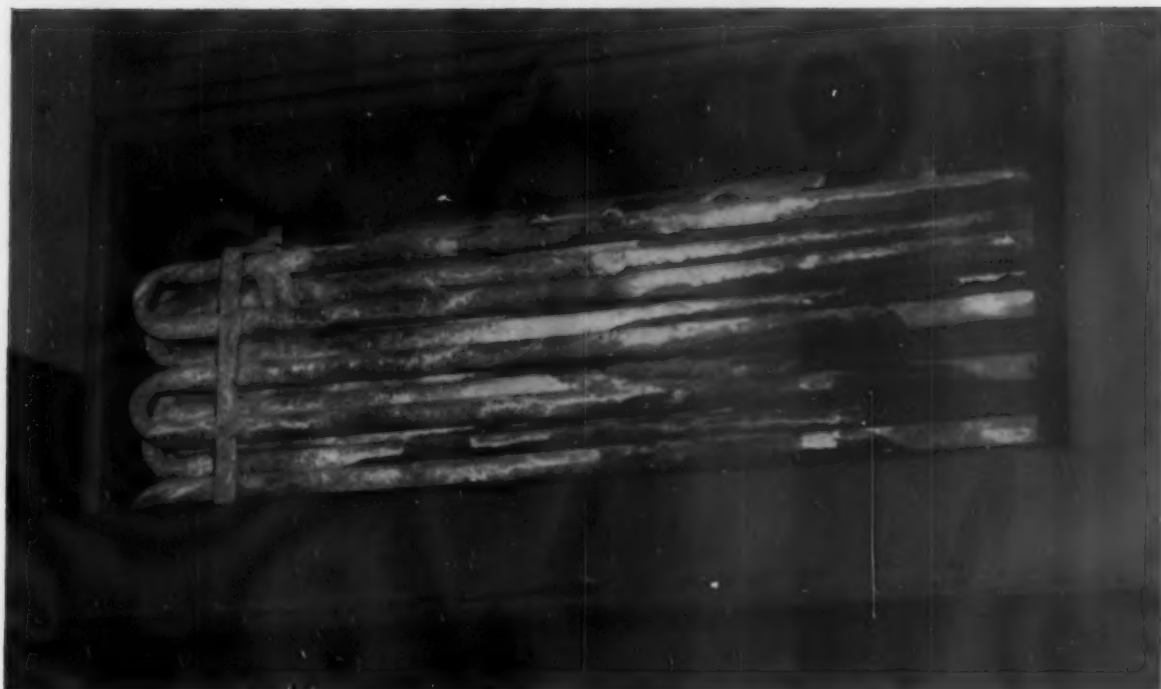
- Safety factor of at least 5
- Thickness of metal increased at points of concentrated stress
- Homogenous metal composition throughout
- Extremely high resistance to impact and corrosion
- Economy

# GRINNELL

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# **anco COOLEX**

**will save your company money**



## **Prevents SCALE and CORROSION**

Corrosion and scale take an expensive toll in maintenance and repairs on cooling water systems and air washers. Scale can ultimately reduce the efficiency to a point of complete breakdown of your system. Of more immediate concern, rust and scale formations act as insulators and reduce heat transfer to an ineffective minimum. Capacity is lowered, operating costs are increased. ANCO Coolex will keep this from happening.

Coolex is a dollars and sense, preventive maintenance product that prevents scale and corrosion in cooling water systems and air washers by neutralizing the effects of Scale-

forming and corrosive elements. The inexpensive, effective formula protects metal surfaces against rust, pitting and scale formation to keep your equipment operating at the efficiency for which it was designed.

Want to know more about this money-saving product? There are competent ANCO service representatives covering the South. Call or write to one of the offices listed below and the ANCO man near you will be glad to come by and give you the full story. A simple preventative maintenance program now with Coolex may well save you hundreds of dollars of replacement money later.

*Write today and request an Anderson service engineer to make an analysis and recommendations on your plant's water treatment. There is no cost for this service.*

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# Southern Power & Industry

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SOUTHERN POWER & INDUSTRY for MAY, 1959



# Facts and Trends

May 1, 1959

- ◆ **MEMPHIS PLANT** — SPI's Feature semi-technical description in June will cover steam production, power-generating, feedwater, and miscellaneous equipment in this 750,000 kw station.

Photos will include: general view of plant, boiler control panel, circuit breakers, coal conveyor, turbine room, boilers, boiler fans, fly ash and dust precipitator, condenser, circulating water pumps, digital readout and logging system, automatic dispatching system, and simplified flow diagram for the entire plant.

- ◆ **COAL-BURNING GAS TURBINES** — The U. S. Bureau of Mines is preparing to conduct research and development to establish the feasibility of the coal burning gas turbine for power generation in stationary plants.

The program planned to be conducted at the Morgantown, W. Va. Station of the Bureau of Mines will take advantage of more than 12 years of research and development carried out by the Locomotive Development Committee of Bituminous Coal Research, Inc. The Committee is lending to the Bureau of Mines a full-size 4,200 hp gas turbine installation valued at \$1,200,000.

- ◆ **CHEAPER TRANSFORMERS** — The General Electric Company has announced a widespread revision of its distribution transformer prices which will result in an over-all price reduction. Catalog prices have been re-arranged to effect price reductions for most of the company's higher voltage single-phase distribution transformers. Price increases have been made, however, for some of the larger kva single-phase and three-phase pole-type units.

- ◆ **THIS SPOT** in our March issue carried an appeal for more information from the users of plastics in maintenance of plant equipment. The request was repeated in our PLASTICS article in April.

Engineers in Southern plants are already beginning to send in actual facts about their experiences. We will need more and more case studies on this subject. Our usual payments will be made for acceptable articles.

- ◆ **FULLY-AUTOMATED POWER PLANT** — A new 225,000 kw facility, to be constructed at Little Gypsy, La., for Louisiana Power & Light



# ALLEN-BRADLEY REVERSING DRUM SWITCHES



...styled to match the most modern production machines!

Inside and out—this Allen-Bradley drum switch is *all* new. Its trim, modern lines and attractive die-cast aluminum handle will give your production machines "up-to-the-minute" styling.

But there is more than beauty to this new switch. The rugged switch mechanism is a self-contained unit—independent of the enclosure. Misalignment and binding *cannot* occur. The base mounts directly on machine surfaces—without using spacers. And with the wrap-around cover removed, terminal screws are exposed for fast wiring—from the front. Changeover from momentary to maintained contact operation can be made in seconds. Investigate this new "leader" in its field. Send for Publication 6091.



**BULLETIN 350**

Style A wrap-around cover is removed to show the readily accessible front wiring terminals. Max rating: 2 hp.



FOR OFF REV  
BUL 350  
STYLE A SERIES B



MAXIMUM RATING			
PHASE	VOLTS	HP	1/2
SGL	110	2	
	220	2	
POLY	110	2	
	220	2	
DC	950	2	
	115	1/2	
	230	1/2	

ALLEN-BRADLEY CO.  
MILWAUKEE, WIS.



## OILTIGHT CAVITY MOUNTING

A-B Style AF reversing switches can be furnished with sealed shaft and rubber-gasketed, oiltight cover for cavity mounting in a machine base.



## PANEL MOUNTING

The new Style A switches can be furnished for mounting directly on panels. Nameplate which gives ratings is also included with each switch.

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## **Facts and Trends (Continued)**

Company, will be the first fully-automated electrical power generating station. All phases of Little Gypsy's operation — from start-up through operation to shut-down — will be controlled automatically by a special electronic computer system designed and built by Daystrom Systems, a division of Daystrom, Incorporated.

A total of 800 different "steps" are involved in start-up or shut-down, according to representatives of Louisiana Power & Light Company.

- ◆ **STOCKHOLDERS** — Many national organizations are recognizing the desirability of holding stockholders meetings at branch plants in various parts of the country.

Stockholders of Westinghouse Electric Corp. had an opportunity to inspect the Company's modern distribution transformer plant when they attended the 73rd annual stockholders' meeting at Athens, Georgia on April 1.

- ◆ **LIKE MOTHER NATURE MADE** — Polyisoprene rubber, the man-made duplicate of tree-grown rubber, is going into commercial production and use for the first time. United States Rubber Co. has begun the production of truck tires made of polyisoprene rubber which is manufactured by Shell Chemical Corp. for sale at a price which is competitive with that of the natural product.

The commercial availability of polyisoprene rubber, company executives pointed out, will free the United States completely from dependence on foreign sources of natural rubber in times of emergency. Until now it has been necessary to use natural rubber in all large tires for both military and civilian use.

- ◆ **INSPECTION REPORTS** by S. L. Terry in this issue is presented in a manner that is different from SPI's usual form. To tell this valuable story in its entirety would take too many pages.

Therefore, only the general information and some sample forms are presented in the article. But the editors are making the entire group of forms (21 sheets) available free to readers who request them.

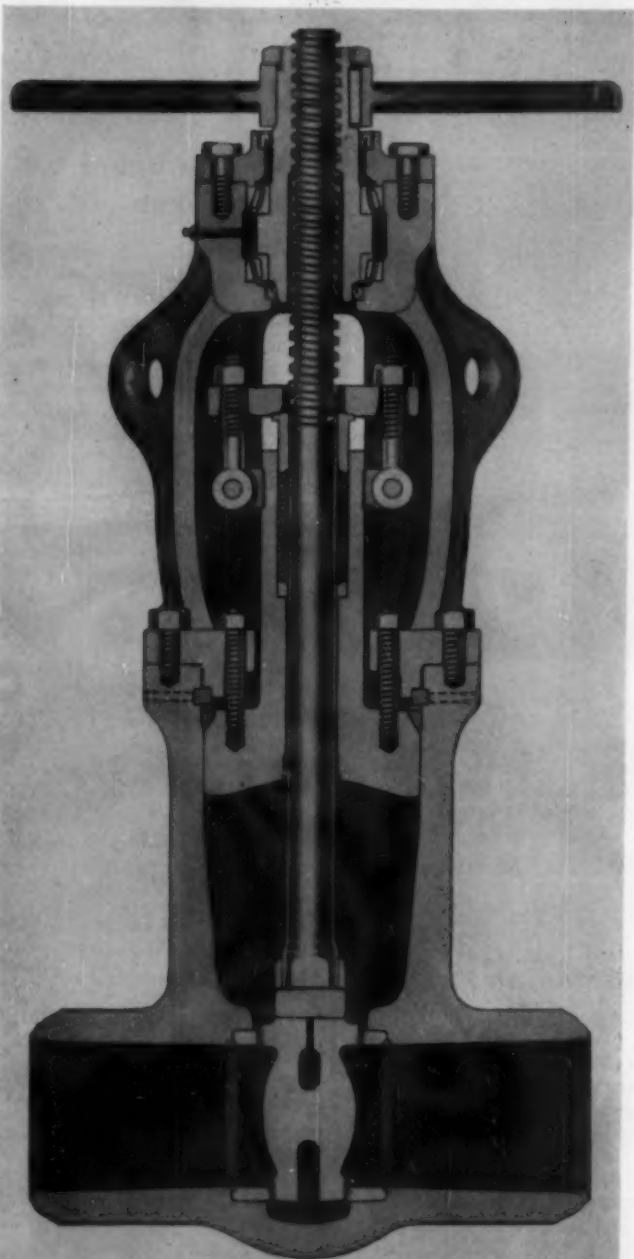
- ◆ **MOTOR REPAIRS** — A new solventless epoxy "thin-wall" encapsulation process called Super Coilife is now being used by all Westinghouse Electric Corp. repair shops for extended operating life of rewound electrical motors.

Low viscosity of the epoxy provides superior penetration into the spaces between the windings and through the slots for completely void-free encapsulation. The new process can be furnished on Class A, B, or F rewinds with their respective maximum operating hot-spot temperatures of 105, 130 and 155 C.

Write the editors for additional information on any of the above items.  
SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 8, Ga.



# Here's the Ultimate in the Control of High Pressures, Temperatures...



Sectional view of 1500-pound Steel Pressure Seal Gate Valve. 600, 900 and 2500-pound valves are also available—in all commercial sizes. Steel Pressure Seal Globe, Angle, and Check Valves are also included in the complete Powell Line.

## POWELL PRESSURE SEAL VALVES

When Powell Steel Pressure Seal Valves are specified and installed on high pressure, high temperature lines you can be sure of top performance in controlling the flow of the fluids being handled.

Superior features of design and construction, many found only in Powell Valves, make this possible. For example:

- Sturdy studs hold the yoke to the body, eliminating the need of a heavy clamp, and maintaining perfect alignment and rigidity of yoke to the body.
- Stellite faced pack-under-pressure seat and stem guide insure tight sealing and accurate guiding of stem.
- Lifting lugs in yoke facilitate handling the valve during erection and maintenance, and provide means for supporting weight of the valve.
- The gasket can be removed without damaging the sealing surface of the body. The gasket seating surface in the body can be easily lapped, if required—an outstanding feature of Powell design.

These are a few of Powell proven features. There are others we'd like to tell you about. Write—or consult your nearby Powell distributor.

### THE WM. POWELL COMPANY

*Dependable Valves since 1846*

**Cincinnati 22, Ohio**

BRONZE • IRON • STEEL

CORROSION RESISTANT METALS AND ALLOYS

## POWELL ...world's largest family of valves



## the ***SOUTH—SOUTHWEST***

*more power . . . more plants . . . more money*



### **Addition for Temco**

Temco Aircraft Corporation engineers are moving into a 52,500 sq ft addition (below dotted white line) to the Engineering Center at Garland, Texas. Both the Center and the general office building, joined

to it by the vaulted white roofed lobby, were completed in 1957. The new extension will provide additional room for electronics laboratories and for advanced technological research. Temco is prime contractor for the Corvus missile and several electronics systems.

### **Anchor Metals — Plant for Alabama**

Plans to activate a new division of **Anchor Metals, Inc.** at Anniston, Ala. are being effected. Anchor, with administrative headquarters at Hurst, Tex., is one of the nation's leading firms engaged in the design, fabrication and testing of steel electrical transmission towers and switchyard structures.

The company will occupy a site formerly owned by the J. I. Case Co. It includes approximately 12 acres of land and a plant containing 175,000 square feet of floor space.

Anchor has taken over the site and operation will begin by September.

### **Continental Can Underway in Ga.**

The Daniel Construction Company of Greenville, South Carolina, has been awarded the general contract for construction of **Continental Can Company's** bleached board mill at Augusta, Georgia.

Construction is underway, with operations set for the last quarter of 1960. The mill will produce 350 tons per day of bleached paper and board for use in packaging food products.

Designed for step-by-step expansion, the mill is to be located on a 2,600-acre site, on the main line of the Georgia Central Railroad, 11 miles south of Augusta.

### **\$30 Million Board Plant for Tenn.**

The M. W. Kellogg Company has received a contract for approximately thirty million dollars to engineer and construct a 500 ton kraft pulp and liner board plant for the **Tennessee River Pulp and Paper Company**. The plant will be located at Counce, Tennessee on the Tennessee River just south of the Pickwick Dam.

The M. W. Kellogg Company has entered into a subcontract with H. A. Simons Ltd. of Vancouver to assist in the design of the plant. Initial construction operations have started and the construction schedule calls for completion by January 1, 1961.

J. A. Loep of the Kellogg organization has been assigned as the Resident Construction Manager at Counce.

### **Mersize Plant in Production**

Operations have begun at **Monsanto Chemical Company's** new plant at Nitro, W. Va. for the manufacture of Mersize, a chemically fortified pale rosin size used by paper manufacturers to give water resistance to paper and paper board.

The new unit is integrated to its rosin raw material supply from a fractionating plant for crude tall oil, jointly owned by Monsanto and Emery Industries, Inc., which began operations here last summer. The latter plant is capable of processing 36,000 tons of crude tall oil per year.

Lloyd D. Shand, manager of paper chemicals sales for Monsanto's Organic Chemicals Division, said that location of the new Mersize unit here constitutes the northernmost integrated rosin and size production facilities in the United States.



THE M. W. KELLOGG COMPANY

*The Eddystone Story:  
Central station  
power piping  
for  
supercritical  
service*

1200 PSI  
5000 PSI

AS POWER PIPING BECOMES MORE CRITICAL

**M. W. Kellogg's**  
**Complete**  
**Power Piping**  
**Service**  
**Keeps Pace**

The services performed on one major assignment—the supercritical power piping for Eddystone Station, Unit No. 1—are evidence of The M. W. Kellogg Company's capability to solve the many critical problems encountered with power piping in the modern steam-electric plant.

Kellogg's services for Philadelphia Electric Company during the course of this project have included metallurgical research, flexibility analysis, material specifications, K-welding® and testing during fabrication in Kellogg's Jersey City shop and during field erection.

Some idea of the magnitude and complexity of Kellogg's responsibilities at Eddystone, and how problems were solved, may be obtained from the new 12-page Kellogg booklet, "The Eddystone Story", shown above. Copies will be sent promptly on requests from consulting engineers, engineers of power generating companies, and manufacturers of boilers, turbines, and allied equipment.

- Metallurgical Research
- Flexibility Analysis
- Material Specifications
- Shop Fabrication
- Field Erection

Kellogg welcomes the opportunity to discuss any or all of its complete power piping facilities with representatives of the industry.

**Fabricated Products Sales Division**

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## **News of the South-Southwest — more power . . . more plants . . . more money**

### **Rug Plant — Ga.**

Nearing completion is the \$2,000,000 Georgia Rug Plant "B," at Lyerly, for **Bigelow Sanford**. Daniel Construction Company is general contractor.

### **New Orleans Refinery Expands**

An extensive modernization program is underway at the crude oil refinery in New Orleans, La. for **Bay Petroleum Company**, a division of Tennessee Gas Transmission Company.

The program includes: installation of a 2700-barrel-per-day alkylation unit for the production of high quality gasoline; revamping of the plant's catalytic cracking unit to increase its capacity to approximately 13,000 barrels a day, to provide additional alkylation feedstocks, and to improve gas recovery facilities to increase the recovery of propane; installation of a new two-stage crude oil distillation unit (with a 33,000 barrels per day capacity) to reduce operation and maintenance costs and to obtain better yields of premium products.

Approximately 200,000 barrels of crude and product tankage and additional steam plant and other utilities facilities will also be installed. Design of the new facilities and other preparatory work have been in progress for more than a year. Completion is expected in early 1960.

### **Alkylation Plant Completed in Tex.**

The Fluor Corporation, Ltd. has completed construction work on a 3,000 barrels-per-day sulfuric acid alkylation plant at Houston, Texas for **Petro-Tex Chemical Corporation**.

Part of the capacity of the plant will be used to produce alkylate for Plymouth Oil from feed supplied by Plymouth. Petro-Tex will make alkylate from butylenes supplied by its butane dehydrogenation plant. All of the alkylate will be of the quality required for aviation gasoline.



### **\$9 Million Tire Plant for Ky.**

Ground-breaking for the tire manufacturing plant of **General Tire & Rubber Co.** is underway at Mayfield, Ky. Construction and equipment installation will be completed and manufacturing begun in 14 months.

The factory, located on an 80-acre tract, will initially have 400,000 square feet of floor space. It will be basically a one-story, masonry construction providing a continuous-flow production design. It is expected that the new operation, when it reaches peak production, will employ nearly 1,000 persons.

Actually, the plans for the Mayfield operation have been so designed that the plant can be readily expanded to four times its original size as the demand warrants it. The initial phase is estimated to cost from \$8,000,000 to \$9,000,000.

### **Modernization at Connors Steel — Ala.**

Nearing completion for **Connors Steel Division, H. K. Porter Company, Inc.**, are new steel making facilities at its Connors Works in Birmingham, Ala.

The modernization will cost approximately a half-million dollars and increase annual ingot tons output by approximately 25%. The expansion includes construction of a pouring building, adjacent to the furnace department, with a 25 ton crane and the installation of pouring car equipment. These new facilities will allow operation of all three of Connors electric furnaces simultaneously instead of the former procedure of two melting and the third as a spare. It is expected additional personnel will be needed to handle the increase in tonnage.

### **Union Machinery — \$400,000 Expansion**

American Machine & Foundry Company is planning a \$400,000 expansion program for its **Union**

**Machinery Company** plant in Richmond, Va.

The new plant enlargement has been planned to accommodate production facilities for AMF's new AMFlow process, which helps automate the processing of bread dough. The new AMF process accomplishes in one operation what requires three separate departments in most large commercial bakeries.

The new unit of the plant will cover some 42,000 square feet. The larger plant will require the hiring of about 100 new employees. The present plant is about 64,000 square feet and employs 113 people.

Union Machinery Company is also the country's largest manufacturer of roll processing machinery.

### **Alton Box — Tenn.**

A two story building has been leased in Humboldt, Tenn. by **Alton Box Board Co.** of Alton, Illinois and equipment is being installed for the manufacture of corrugated and solid fibre shipping containers.

**Clark D. Thornton** has been appointed manager of the container plant which will initially employ 25 persons.



# Problem: A BIG MEMPHIS SUPERMARKET NEEDED A STORE FRONT THAT WAS DIFFERENT AND ECONOMICAL

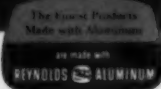
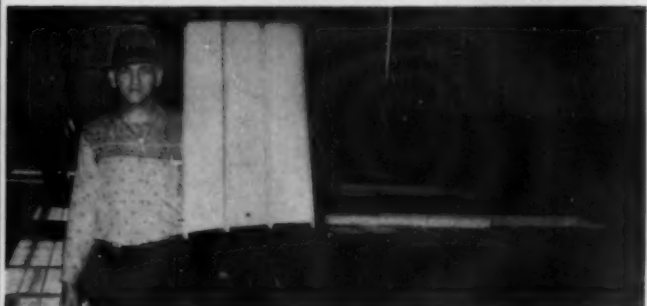
## Solution:

IN MEMPHIS, National Tea Stores wanted a different and attractive store front for a building nearing completion. Our Memphis industrial sales representative, Jerry Harding, had talked to one of the contractors, about Colorweld baked enameled aluminum and a color sampler provided by Jerry was given to the National Tea engineers. They were enthusiastic, but they had to be shown that Colorweld could be formed to the desired shape. At this point, Toma Machine and Supply Company came into the picture.

WITH TIME SHORT, Jerry, with the color chosen by the engineers, had a sample sheared to size in our Memphis plant and rushed it to Ben Toma for trial. In less than 24 hours the formed panel was successfully produced and placed in the hands of National Tea's purchasing department. All specifications were met by the Colorweld panel and an order was placed with Toma for the panels necessary to complete the job.

JERRY HARDING played the part of a truly creative salesman in this story. His close cooperation with Toma and with the other principals helped create acceptance for the product, and ultimately gave National Tea Stores a permanent, attractive store front that will be inviting to shoppers for many years to come. Jerry is just one of over 140 trained service representatives who are always on call to help you with your materials problems. Colorweld is just one of hundreds of products in our warehouses right now waiting for your order.

OUR TRAINED SALES representatives welcome the opportunity to help solve your materials problems. Our vast inventory of metals and other industrial products make economical solutions easy. Having more than ten acres of materials from which to select at your disposal can mean the difference between red ink and black ink in your books, and this is exactly what we have to offer . . . PLUS the kind of assistance demonstrated in this story. Why not call our nearest Branch today?



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INDUSTRIAL BUILDING PRODUCTS  
STEEL FLAT SHEETS  
BRASS & COPPER  
STAINLESS STEEL



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Nashville, Tenn.  
Richmond, Va.

Miami, Fla.  
Jacksonville, Fla.  
Memphis, Tenn.  
Raleigh, N. C.  
Savannah, Ga.

REYNOLDS ALUMINUM SUPPLY CO.

Established 1914

GENERAL OFFICES: ATLANTA, GEORGIA

## News of the South-Southwest — more power . . . more plants . . . more money

### \$7.5 Million for N. C. Expansion of Amerian Enka

American Enka Corporation, a major rayon and nylon yarn and fiber producer, is underway on a \$7,500,000 expansion of the company's nylon plant at Enka, N. C. which will double its capacity.

Designed to provide Enka with a well-rounded line of nylon yarns in various deniers, lusters and put-ups, the new addition will go into production by early 1960.

When the enlarged installation is in full operation, plant personnel will be increased by more than 300 employees.

New construction to house the enlarged operation will adjoin the present building and will range from one to six stories in height. Total floor space will be increased 65 per cent.

Detailed planning work is well advanced by Enka's General Engineering Department. R. M. Hart has been appointed project engineer and C. W. Rice, engineering services manager, is responsible for construction.

### Distribution Center for Sylvania

Sylvania Electric Products, Inc. has announced plans to build a 45,000-square-foot Distribution Center in the Shirley Industrial District of Fairfax County, Va., to replace leased facilities at Alexandria, Va.

The building, which will include warehousing and sales & service facilities, will be located on a five acre tract. The company expects to occupy the building next fall.

The center will serve southern portions of Maryland, including Baltimore; Washington, D. C.; Virginia, and parts of North Carolina. The new location will provide ample land area for future expansion and off-street parking.

Products initially distributed by the center will include incandescent, fluorescent, and photoflash lamps and other lighting products and television picture tubes. In addition, the center will serve as headquarters for various Sylvania commercial sales groups in the area and for government lighting sales.

### PLANT PERSONNEL

#### Engineering-Management Promotions Announced by Major Southern Plants

J. Morgan Davis has been named manager of the Coats & Clark plant at Acworth, Ga. He succeeds Edgar Hembree, who is being transferred to the company's New York office.

According to G. W. E. Nicholson, President, Tennessee River Pulp & Paper Co., the following appointments have been made for the Counce, Tenn. mills: **Ray F. Cuyle**, General Superintendent; and **Cecil Carter**, Plant Engineer.

Buckeye Cellulose Corp. has appointed **Charles A. Montague, Jr.** as plant manager of its cellulose pulp plant in Memphis, Tennessee. Mr. Montague succeeds P. S. Moore, Jr., who has been transferred to a management position in Charmin Paper Products Co., Green Bay, Wis.

Named to the general foreman position for the Central, S. C. plant of Pratt, Read & Co., Inc. is **Albert C. Schollkopf, Jr.**

Appointments at the Birmingham, Ala. office of the Rust Engineering Co. include: **Joel P. Campbell**, head of the Electrical Design Section; **Homer M. Lloyd**, project manager in charge of projects involving steam & power plants, metallurgical plants and blast furnace facilities; and

**William T. Goodwin**, formerly with a rayon plant in Rome, Ga., a project manager.

Acme Industries, Inc. has appointed **Richard L. Bishop** as manager of the Houston, Tex. branch.

Transferred from control chemist in the Technical Dept. of American Viscose Corp.'s Fredericksburg, Va. cellophane plant to water and waste control chemist at the Fibers Div. in Marcus Hook, Pa. is **Ernest C. Ladd**.

**S. P. Patterson** has been named manager of the Lane Co. of Tennessee, Inc. at Smyrna, Tenn.

Appointed General Manager of the Longview, Tex. plant of Marlow Pumps Div., Bell & Gossett Co. is **S. R. Schleicher**.

Magnavox Co. of Tennessee has named **George Leinenweber** General Manager, succeeding W. H. Graham.

General Manager for the Newcomb Spring Corp.'s new spring manufacturing plant in Atlanta, Ga. is **Charles R. Porter**.

**Henry T. Chandler** has been named Manager of the Chattanooga, Tenn. plant of Quaker Oats Co.

Girdler Catalysts of Louisville, Ky., a unit of Chemetron Corp.'s chemical products division, has appointed **Murrell D. Long** production superintendent.

### Trailer Plt. — Kans.

\$1,000,000 trailer manufacturing plant for Hutchinson, Kans. is underway and expected to be in production by August 1.

The plant will be operated by **Detroit Mobile Homes Inc.**, turning out 20 trailers a day. Initial employment will be 100-150 with approximately 300 expected to be employed by the summer of 1960.

Dondlinger & Sons of Wichita are the general contractors.

### Opelika Mfg. Expands in Ga.

Underway for the **Hawkinsville Division of Opelika Mfg. Corp.** is a 15,000 sq ft expansion program which will increase production approximately 20% and add some 60 employees.

Completion is anticipated for the fall. **Fiske-Carter Construction Co.** of Greenville, S. C. is building contractor.

*facts about Superior Packaged Boilers*

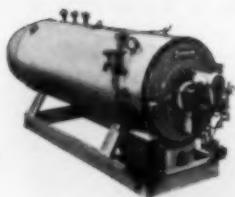
## **SUPERIOR'S MID-SHELL FURNACE LOCATION**

**protects against the two most common causes of furnace failure**

One of the often overlooked, and yet very important considerations for the purchaser or specifier of boilers of the horizontal fire-tube type is the location of the furnace in relation to the boiler shell. To a great extent this location is determined by whether the boiler is of the up-draft or down-draft type. Up-draft units usually have the furnace set low inside the shell. Down-draft units usually have a higher furnace location.

Ideally the furnace is located near the center of the shell, where it is protected from the two most common dangers which can cause bagging, blistering or complete burnout of the furnace.

The first of these dangers is low-water. When the furnace is located too high in the shell, the covering layer of water is necessarily less, and the danger is increased. When the furnace is too low within the shell, mud and silt can deposit on the bottom of the shell and eventually bridge to the bottom of the furnace, cutting off circulation and causing a burnout of the furnace. The adjacent diagrams show the location of the furnace in other fire-tube boilers and in Superior Type C boilers. When you buy or specify a packaged fire-tube boiler consider this important fact.

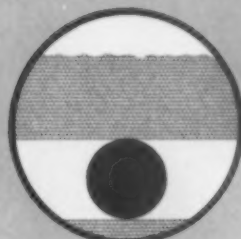


**SUPERIOR "TYPE C"  
PACKAGED BOILERS**

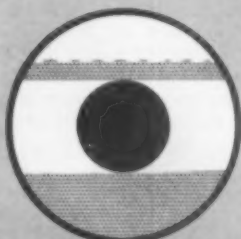
Completely packaged fire-tube units for capacities from 20 to 350 bhp. Rotary burners on all sizes. Induced draft for clean, quiet safe operation. Fully insulated and ready for service burning oil, gas or both in combination. Pressures to 250 psi, or for hot water operation. Other fire-tube models for capacities to 600 bhp. Write for Bulletin 1011C.

**Specialists in PACKAGED BOILERS... exclusively**

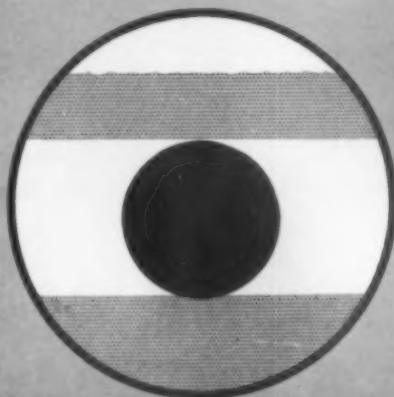
**SUPERIOR COMBUSTION INDUSTRIES, INC.  
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.**



**LOW FURNACE...MUD BURNOUT DANGER**



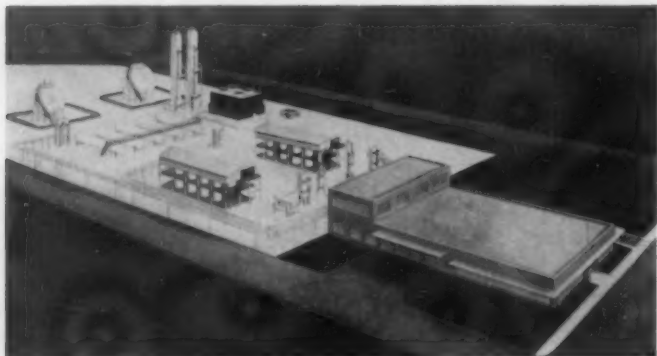
**HIGH FURNACE...LOW WATER BURNOUT DANGER**



**MID-SHELL LOCATION GUARDS AGAINST BOTH**

**SUPERIOR**  
PACKAGED BOILERS

## News of the South-Southwest — more power . . . more plants . . . more money



### Firestone Rubber Plants for Texas

The Firestone Tire & Rubber Company has announced that it will build the world's first plant for the production of synthetic Diene and Coral rubbers. Both Firestone products, Diene is a partial replacement for natural rubber, and Coral is a complete replacement.

### Texas Eastern Transmission Corp.

Construction of what is expected to become the largest single underground storage reservoir for liquefied petroleum gases in the nation has been started at a site near Houston, Tex., according to Millard K. Neptune, senior vice president of Texas Eastern Transmission Corporation. The site is at the center of the Barber's Hill Salt Dome, a giant underground deposit of pure salt.

The first storage well, commonly known as a "jug well," was spudded and will be drilled to a total depth of about 3500 feet or about 2500 feet into the salt. Upon completion of the well, fresh water will be used to wash out a cavity in the salt which will hold 21,000,000 gallons of LPGas. A second jug well of the same capacity is planned later this summer.

When completed this fall both wells will aggregate a storage capacity of 42,000,000 gallons which will be used as an accumulation storage terminal for LPGas produced in the Texas Gulf Coast area and destined for shipment through Texas Eastern's Little Big Inch pipe

The plant will be an addition to the company's Petrochemical Center in Orange, Texas.

Preliminary engineering work for the new plant has been done. It will have an annual capacity to produce 30,000 tons of either product upon its completion in 1961. The Company will be able to switch from production of one to the other as demand requires.

line to Midwestern and Eastern markets. The company will also construct a 12-inch pipe line this summer to connect the Mont Belvieu terminal with the Little Big Inch pumping station at Baytown.

### Spinning Mill for Sumter, S. C.

Plans are being laid for construction of a worsted spinning mill for the newly established Mackie Spinning Mills in Sumter, S. C.

Henry Mackie is President of the new company which will produce a fine worsted thread.

### Kaiser Expands Chalmette Works

Construction of more than \$1,000,000 in improvement projects is underway in the metal products section of the Kaiser Aluminum & Chemical Corporation's Chalmette Works in Louisiana.

Chalmette Works Manager Walter

Bast said that "the decision to expand the plant's metal processing facilities is an expression of confidence in Chalmette and in the future demand for aluminum."

The improvements call for the following: A 50 per cent increase in the plant's billet casting facility, including two new furnaces and a casting pit; the installation of a second homogenizing furnace; and the installation of a new furnace and conveyor in the small pig and ingot section that will add 7½ million pounds per month to that section's casting capacity.

### Homelite Plant Underway — S. C.

A multi-million dollar plant just outside Greer, South Carolina, is underway by Daniel Construction Co. for Homelite, a division of Textron, Inc.

The company expects to transfer manufacture of a large portion of their line, including generators, pumps and blowers, to their new 150,000 square foot plant upon its completion in June.

### D P & L Expansion

The Dallas Power & Light Company has budgeted \$17,960,170 for expenditure during 1959 on new construction and property replacements. This compares with actual expenditures totaling \$15,256,401 for the same purposes for 1958.

The Company's largest construction project now in progress is the first unit of its new North Lake Plant, which is scheduled for operation in 1960. The unit will have a generating capability of 175,000 kilowatts. When it is placed in service the Company's total generating capability will be 1,131,000 kilowatts, approximately seven times as much as it had ten years ago.

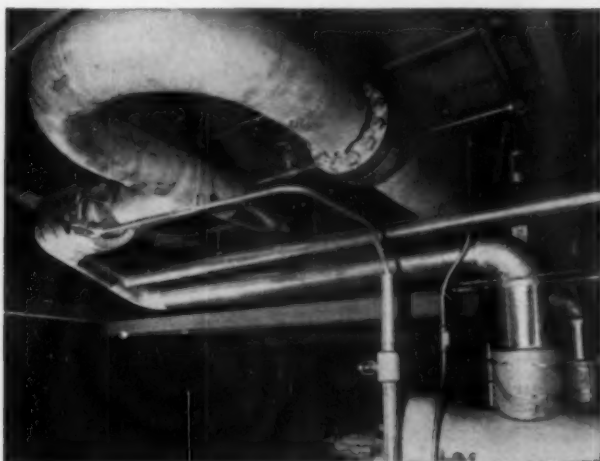
On the North Lake project the Company expects to spend approximately \$8,800,000 in 1959. The total cost of this unit, together with the cost of building a lake to provide cooling water, as well as pumping facilities, will be approximately \$17,900,000.



# 25 YEARS\* OF SATISFACTION with MIDWEST PIPING

That is the experience  
of THE HAWAIIAN  
ELECTRIC COMPANY

Of the eight piping contracts the Hawaiian Electric Company placed with Midwest during the past quarter century, two were for the L. A. Hicks Plant shown above.



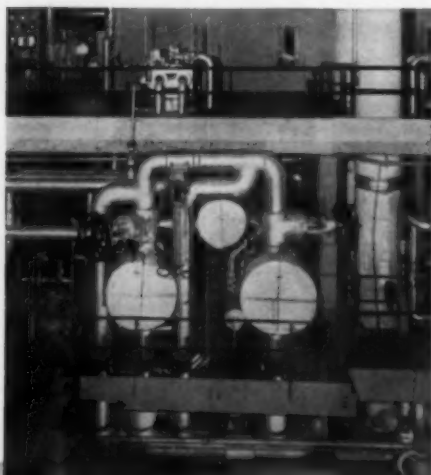
Boiler feed piping fabricated and installed by Midwest for the last unit in the L. A. Hicks Plant in Honolulu.

Benefits that Hawaiian Electric and many other electric utilities get by using Midwest Piping include:

- Unequalled experience of Midwest fabrication and construction organizations.
- Erection planning by staff engineers before fabrication.
- Accurately fabricated subassemblies that simplify and expedite field erection.
- Convenient locations of three fabricating plants.
- Continuous piping research and development.

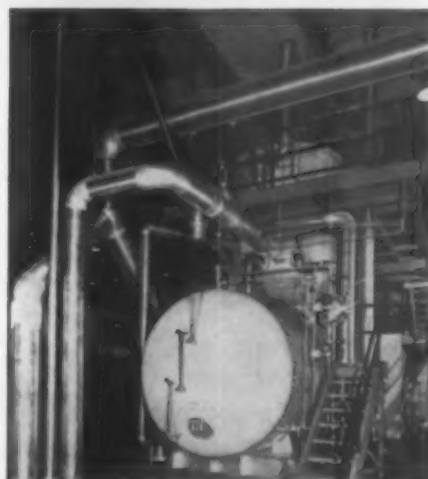
This adds up to a better piping job . . . on time and at minimum cost. It will pay you to call in Midwest the next time you need piping.

**8**  
\* CONTRACTS SINCE 1933



(Left) Showing Midwest Piping for horizontal and vertical feed water heaters for last two units at L. A. Hicks Plant.

(Right) Main steam and deaerator piping for last unit. Design conditions are 1500 psi and 950°F.



8093

## MIDWEST PIPING COMPANY, INC.

Main Office: St. Louis 2, Mo. (P. O. Box 433)

PLANTS: ST. LOUIS, CLIFTON, N. J. and LOS ANGELES

SALES OFFICES: Asheville (Box 446, Skyland, N.C.) • Atlanta 9—72 11th Street, Northeast • Boston 27—426 First Street  
Chicago 3—79 West Monroe St. • Cleveland 14—616 St. Clair • Houston 2—1213 Capitol • Los Angeles 33—520 Anderson  
Miami 34—2103 Le Jeune • New York 7—50 Church St. • Pittsburgh 19, Pa.—437 Grant • San Francisco 11—420 Market St.  
St. Louis 4, Mo.—1450 South Second St. • Tulsa—1640 East 21st St.

**MIDWEST**  
PIPING SERVICE IS  
NATIONWIDE



# Continental Conveyors ...in action!



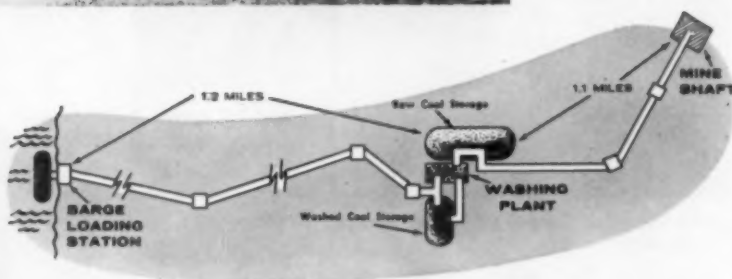
Elevated construction  
avoids periodic  
flood conditions



Part of the 2.3 mile run,  
moving raw coal to  
preparation plant



One of 5 power stations and transfer points.



## -at DEKOVEN MINE

PITTSBURG AND MIDWAY COAL MINING COMPANY. Sturgis, Kentucky.

From mine shaft, over 1.1 miles of belt conveyor to storage, washing, storage and reclaim, over 1.2 miles to river loading station . . . over rugged terrain, up and down hill, across low areas . . . DeKoven Coal travels the Continental Road: 500 tons per hour at 500 feet per minute on 36" belt, 900 tons per hour at 580 feet per minute on 42" belt.



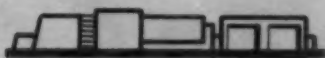
INDUSTRIAL DIVISION

**Continental** **Gin Company**

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • DENVER • HOUSTON • HUNTINGTON • MEMPHIS • MOBILE • NEW YORK 17

*We'll be glad to assist you with your conveying problems. Call, wire or write your nearest Continental office.*



TODAY'S ENGINEERING LEADERSHIP—TOMORROW'S PROGRESS

## Designed Now - Turbines for the '60's

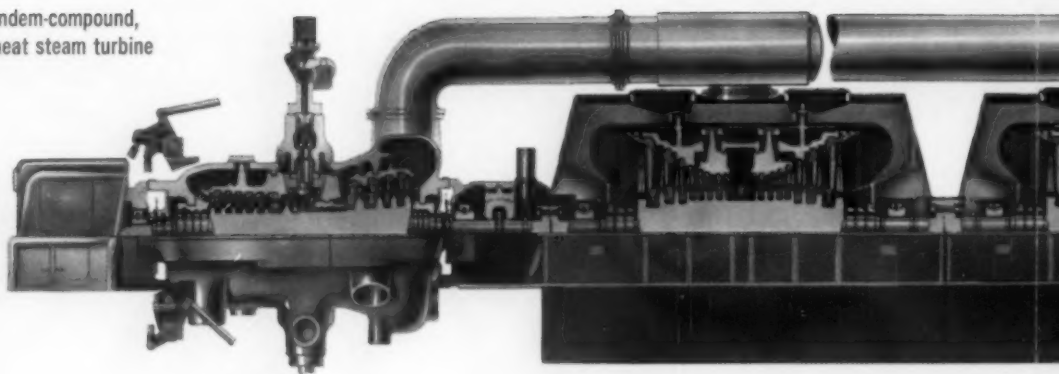
As another step in its continuing progress to help electric utilities keep electric power America's greatest bargain, General Electric is introducing seven advanced-design, pre-engineered steam turbines specifically designed to meet electric generation requirements in the '60's.

The engineering features incorporated in these units—for top reliability, high performance and maximum simplicity—are the result of over 50 years of intensive research and development coupled with bold planning, engineering enterprise and close cooperation with electric utility companies and consulting engineers.

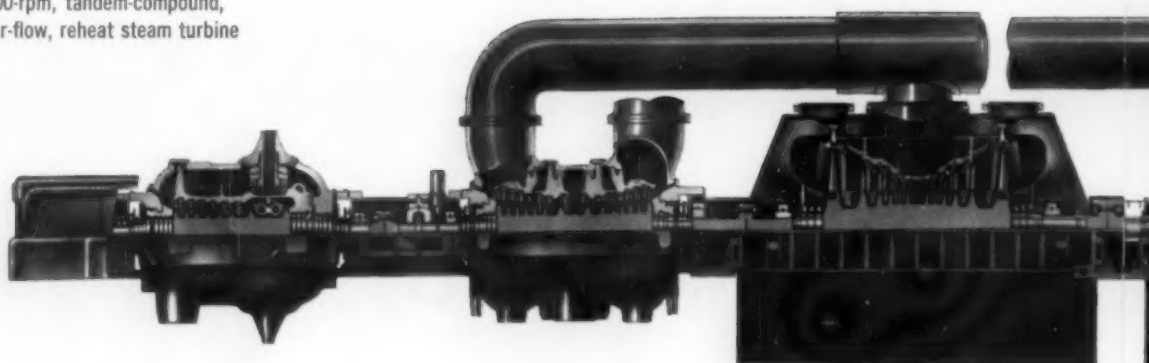
GENERAL  ELECTRIC



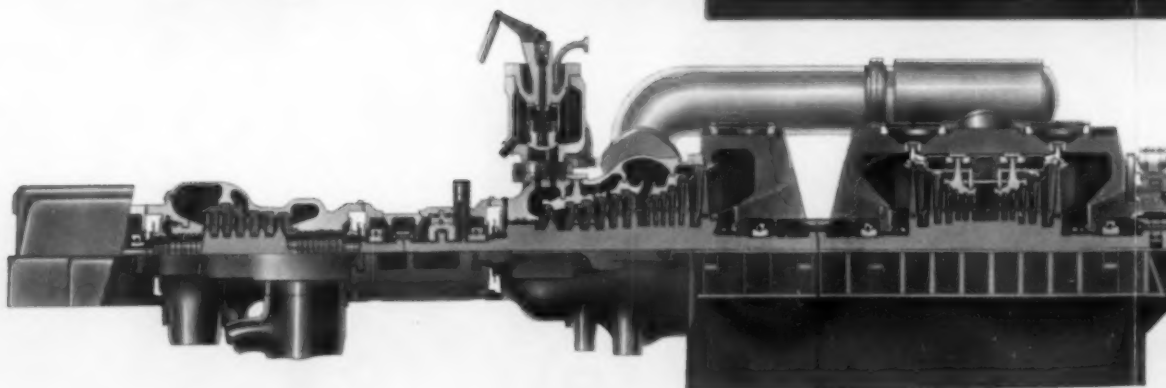
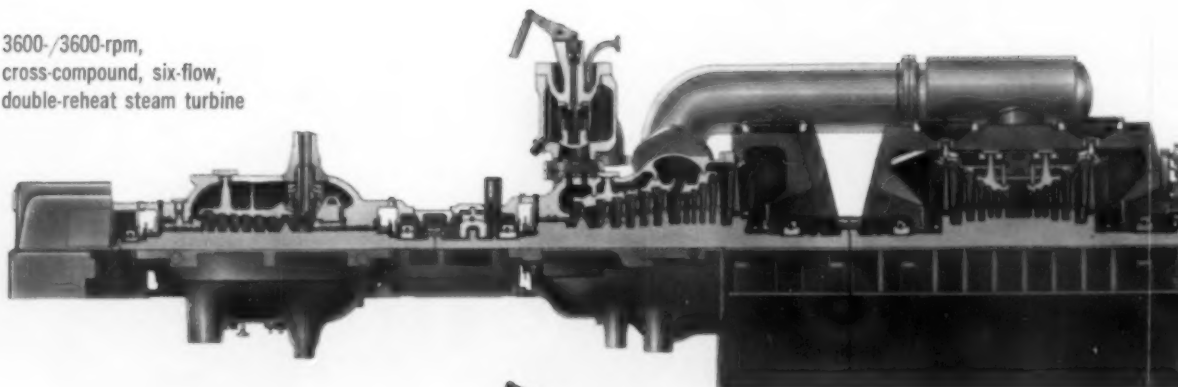
3600-rpm, tandem-compound,  
four-flow, reheat steam turbine



3600-rpm, tandem-compound,  
four-flow, reheat steam turbine



3600-/3600-rpm,  
cross-compound, six-flow,  
double-reheat steam turbine







## Why General Electric Offers More For Your Steam Turbine-Generator Dollar Investment

### Performance

General Electric's progress in attaining higher operating pressures and temperatures and increased component efficiencies is helping to assure further improvement in the coal rate of electric utilities. With the ever-increasing demand for improved performance, a continuous and diversified program of product development is being carried on in the company's research and development laboratories.

### Reliability

General Electric's intensive basic research and development, sound engineering design, modern manufacturing techniques and proper operating practices contribute to the reliability of large steam turbine-generators.

Work performed at the Large Steam Turbine-

Generator Department's Materials and Processes Laboratory and the Product Development Laboratory spearheads these efforts.

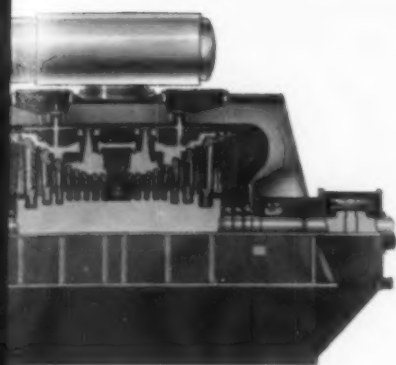
### Service

Completely integrated service—from initial order throughout the unit's operating life—is part of the "added value" purchased with each General Electric steam turbine-generator.

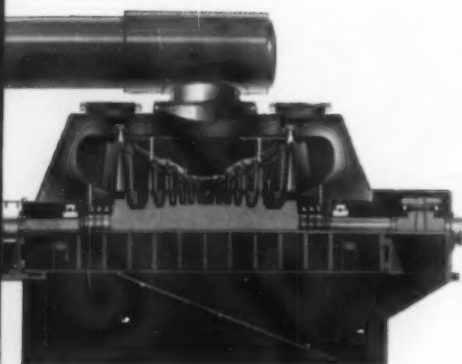
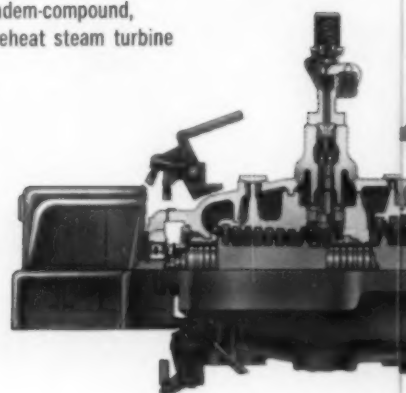
Two-way communication of service information through the turbine-generator Product Service organization enables factory know-how to supplement the efforts of field service representatives, and permits factory specialists to take full advantage of field operating experience.

Improved performance, greater reliability and completely integrated service mean more economical generation of electricity.

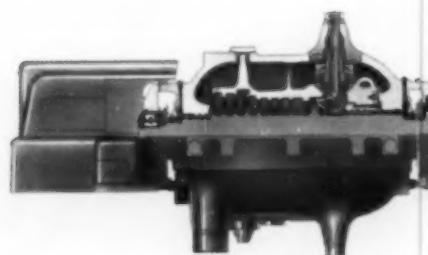
GENERAL  ELECTRIC



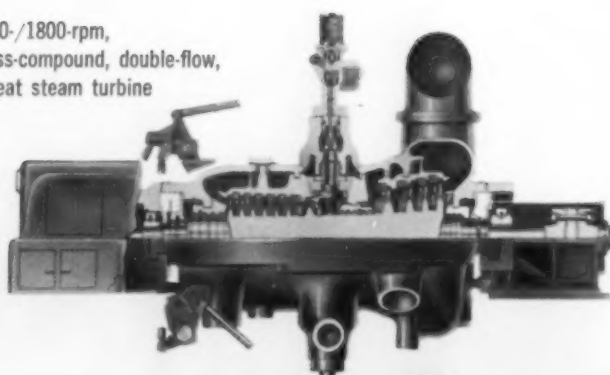
3600-rpm, tandem-compound,  
double-flow, reheat steam turbine



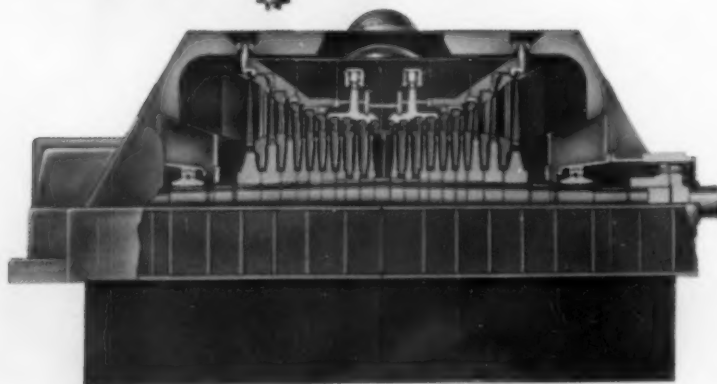
3600-rpm, tandem-compound,  
triple-flow, reheat steam turbine

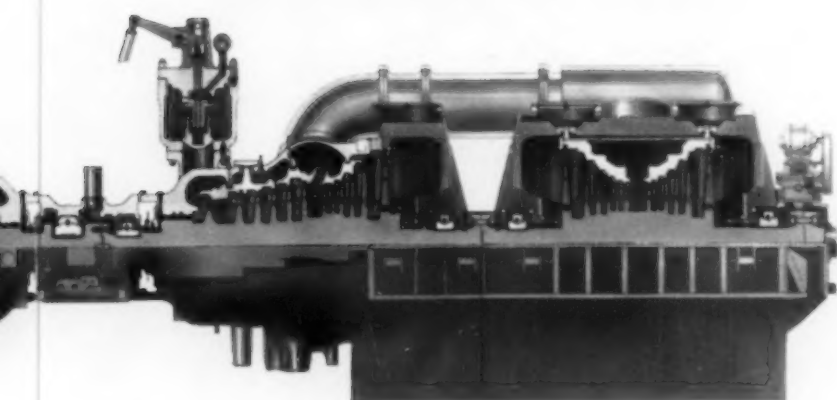
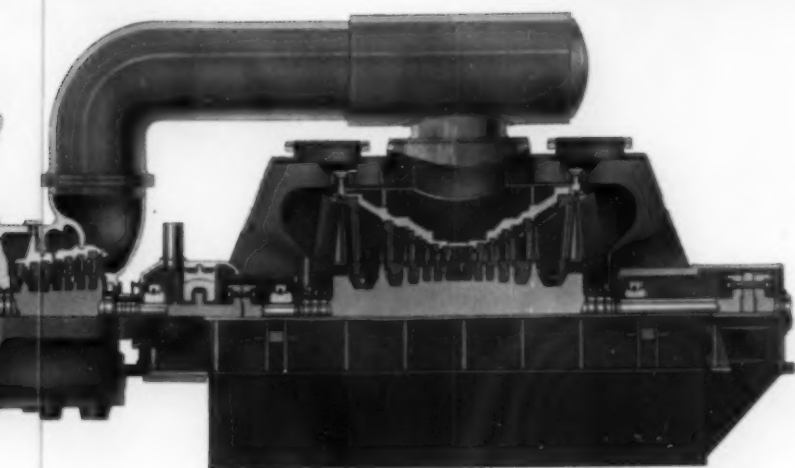


3600-/1800-rpm,  
cross-compound, double-flow,  
reheat steam turbine

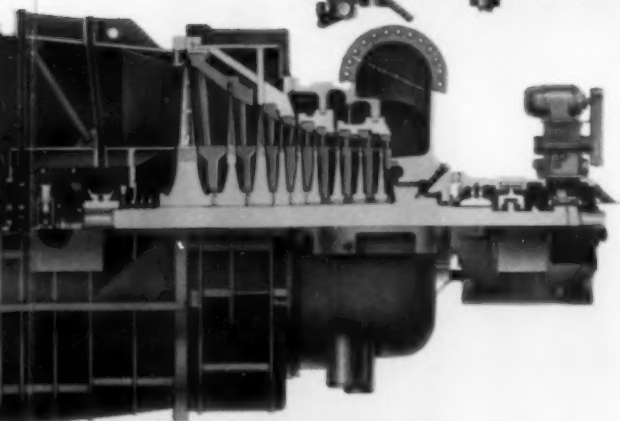
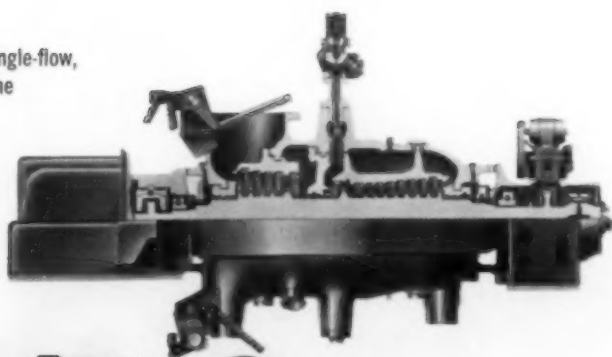


3600-/1800-rpm,  
cross-compound, double-flow,  
reheat steam turbine





600-/1800-rpm,  
cross-compound, single-flow,  
heat steam turbine

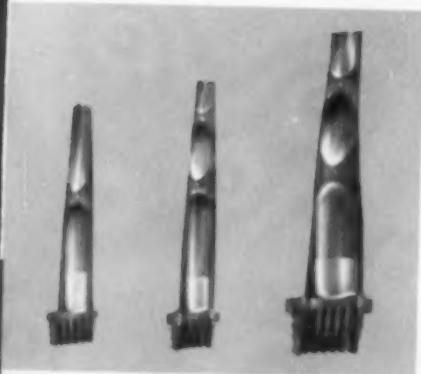


**Pre-engineered  
Steam Turbines  
for the '60's**

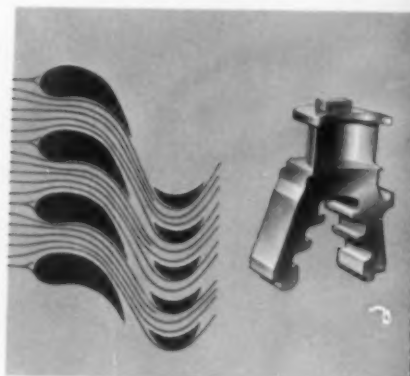
100,000 to 600,000 kw

GENERAL  ELECTRIC

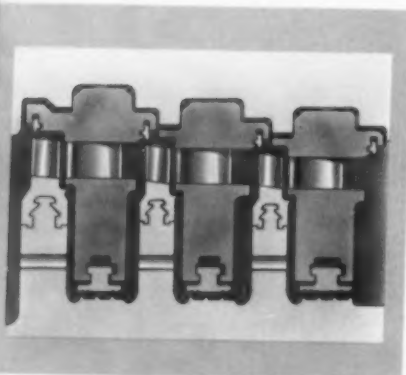
# Important Evaluation Features Of General Electric Pre-Engineered Steam Turbines . . .



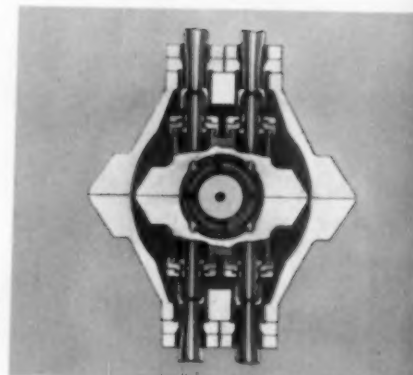
**Progressive  
Bucket Design**



**Impulse-Type,  
Solid Rotor  
Construction**



**Removable  
Radial Spill Strips  
and Spring-Backed  
Shaft Packing**



**Nozzle Box  
Construction**

## . . . What They Mean To You

- Minimized Investment
- Improved Performance
- Simplified Operation
- Increased Availability
- Greater Reliability
- Accelerated Installation
- Reduced Maintenance
- Extended Life

*Progress Is Our Most Important Product*

**GENERAL  ELECTRIC**



## **News of the South-Southwest — more power . . . more plants . . . more money**

### **National Gypsum — Savannah Expansion**

Getting underway for **National Gypsum Co.** is an expansion program which will increase the plant's capacity by 25% in Savannah, Ga.

Upon its completion in the summer of 1960 the expanded plant will have a capacity to produce enough gypsum wallboard lath, plaster and other gypsum building products for some 1,999,000 homes per year.

Daniel Construction Co. of Birmingham, Ala. is general contractor for the expansion of the plant, which is managed by John Burns.

### **Portable Gas Plant**

Recently completed for **Continental Oil Co.** is a \$430,000 portable-type natural gasoline plant on the company's Ramsey lease near Pecos, Tex. Initial processing capacity is 5,000,000 cu ft of gas daily.

Major units for the plant were constructed by Southwest Industries, Inc., contractor, at its Houston plant. On location, the units are assembled and mounted on skids, enabling the plant to be moved from one location to another in a matter of weeks. The mobile plant may be installed in an oil field while the field is being developed.

The gas processed at the Pecos plant will originate in six oil pools in Reeves and Culbertson counties. Plans call for expanding the unit's capacity later this year.

### **Eastman Kodak Expands Facilities**

The **Eastman Kodak Company** plans to invest about \$61 million in company improvements during 1959.

The expenditures will be used for improved facilities at company plants, research laboratories, and offices in Rochester, N. Y., Kings-

port, Tenn., Longview, Tex., and at various Kodak regional sales divisions and other units in the United States.

About \$24 million has been budgeted for capital improvements at the company's Tennessee Eastman and Texas Eastman divisions combined. These divisions produce plastics, man-made fibers, and industrial chemicals.

### **Boston Gear — Tex.**

Construction has begun in Brook Hollow Industrial District in Dallas, Tex. on a new warehouse and office building for **Boston Gear Works**, division of the Murray Company of Texas, Inc., national manufacturers of power transmission products.

The 6,000-square-foot building, to be completed around June 1, will serve as a branch headquarters for authorized Boston Gear distributors in Texas, Louisiana, Oklahoma, part of Arkansas and Mexico.

## **FUTURE EVENTS of Engineering Interest**

**May 4-6: Southern Metals Conference.** Bon Air Hotel, Augusta, Ga. SMC Committee, 567 Banks Mill Rd., S.E., Aiken, S. C.

**May 11-13: Joint Automation Conference;** ASME, AIEE, and Institute of Radio Engineers, sponsors; Pike Congress Hotel, Chicago, Ill. F. D. Synder, c/o Westinghouse Electric Corp., 40 Wall St., New York 5, N. Y.

**May 11-13: Second Annual Power Conference.** President Hotel, Kansas City, Mo. Charles K. Koegel, Pub. Chairman, Kansas City Section of the Instrument Society of America, 8900 Westbrook Dr., Overland Park, Kansas.

**May 14-23: 14th International Petroleum Exposition.** Tulsa, Okla.

**May 18-20: 5th National Symposium.** Instrument Society of America, Hotel Shamrock Hilton, Houston,

Tex. Instrument Society of America, 313 6th Ave., Pittsburgh 22, Pa.

**June 1-5: 5th World Petroleum Conference Exposition.** Coliseum, New York, N. Y. E. K. Stevens, Exposition Mgr., International Exposition Co., 480 Lexington Ave., New York 17, N. Y.

**June 9-12: Material Handling Institute's Exposition.** Public Auditorium, Cleveland, Ohio. W. L. Redding, Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22, Pa.

**June 21-26: Annual Meeting.** Air Pollution Control Association. Statler Hotel, Los Angeles, Calif. Harry M. Pier, Exec. Secy., APCA, 4400 Fifth Ave., Pittsburgh 13, Pa.

**Sept. 17-19: 41st Annual Meeting.** Public Utilities Assoc. of the Virginias, The Greenbrier, White Sulphur Springs, W. Va. Robert W.

McKinnon, Exec. Secy., PUAV, 602 First Federal Bldg., Roanoke, Va.

**Sept. 27-30: 3rd Annual National Power Conference;** ASME and AIEE, co-sponsors; Hotel Muehlebach, Kansas City, Mo. Fred P. Gilpin, Kansas City Power & Light Co., Box 679, Kansas City 41, Mo.

**Oct. 22-23: 15th Annual National Conference on Industrial Hydraulics;** Illinois Institute of Technology & Armour Research Foundation, sponsors; Hotel Sherman, Chicago, Ill. R. D. Meade, Conf. Secy., IIT, 3300 Federal St., Chicago 16, Ill.

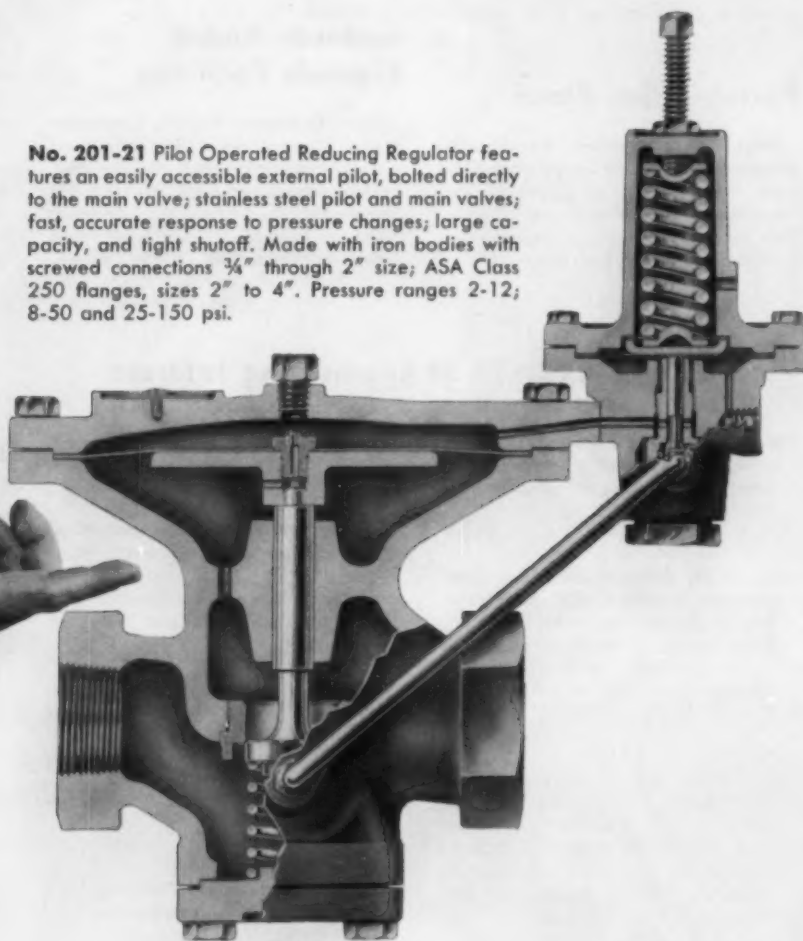
**Oct. 22-25: Annual Meeting,** American Society of Industrial Designers, Grove Park Inn, Asheville, N. C. ASID, 15 E. 48th St., New York 17, N. Y.

**Nov. 16-20: 5th International Automation Exposition & Congress,** New York Trade Show Bldg., 500 Eighth Ave., New York, N. Y. Richard Rimbach Assoc., Inc., 845 Ridge Ave., Pittsburgh 12, Pa.

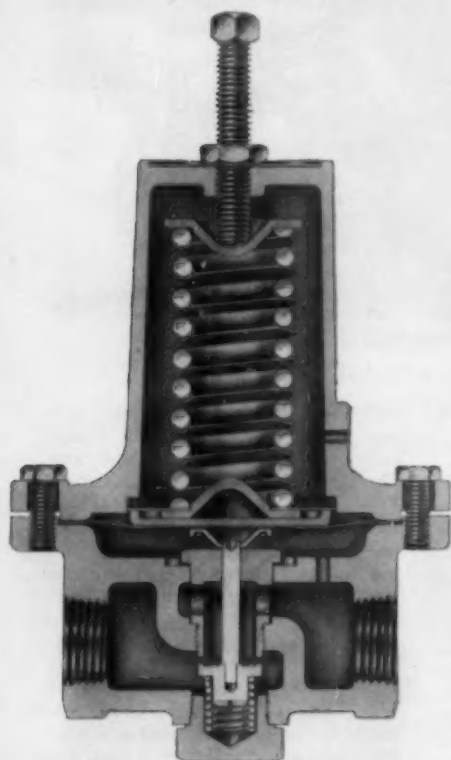


# TWO NEW

**No. 201-21** Pilot Operated Reducing Regulator features an easily accessible external pilot, bolted directly to the main valve; stainless steel pilot and main valves; fast, accurate response to pressure changes; large capacity, and tight shutoff. Made with iron bodies with screwed connections  $\frac{3}{4}$ " through 2" size; ASA Class 250 flanges, sizes 2" to 4". Pressure ranges 2-12; 8-50 and 25-150 psi.



# Masoneilan Valves for Accurate Pressure Regulation



**No. 17-1** Direct Operated Reducing Valve, for steam service, features accurately sized and located ports to minimize falloff; isolated diaphragm chamber for maximum stability; large body passages; lapped seating surfaces for tight shutoff. (No. 17-22 with soft seats for air service, also available.) Made of iron in sizes  $\frac{1}{2}$ ",  $\frac{3}{4}$ " and 1". Reduced pressure ranges 2-12; 8-50; 25-150 psi.

These two new regulating valves are designed to provide accurate control of steam pressures for heating, process supply, makeup systems and general plant use. They embody modern features that make them outstanding in their respective classes, yet modestly priced.

Both are relatively light in weight, compact and easy to install and maintain. Both offer a selection of reduced pressure ranges, adjustable over a suitably wide span.

They are the latest developments in a line of quality reducing valves, pump governors and back pressure regulators which offers a type for practically any industrial requirement. Your Mason-Neilan Industrial Distributor is ready to serve you with assistance in selection and application and to ship promptly from stock. Ask him for catalog or write for your copy.



## MASON-NEILAN

*A Division of Worthington Corporation*

**35 NAHATAN STREET, NORWOOD, MASSACHUSETTS**

*District offices or Distributors in principal cities in U.S.*

*In Canada: Mason-Neilan, Division of Worthington (Canada), Ltd.*



Tanks are made



Cores are made

## **Westinghouse Transformer Plant Athens, Georgia**

Turning out distribution transformers at the rate of one every two minutes is no trick at **Westinghouse Electric Corporation's** new plant at Athens, Georgia.

The new plant was located at Athens for several reasons: to insure better and faster service to important customers in the southeastern states; availability of a good labor market; desirable social and cultural environment; and other economic considerations.

Discussing operations at the Athens plant, Gordon C. Hurlbert, manager of the company's distribution and instrument transformer department, said, "This is one of the largest Westinghouse facilities in the entire South and is certainly the most modern of its kind in the electrical industry."

The single-story plant has more than 560,000 square feet of manufacturing area. A two-story attached office building has an additional 58,500 square feet. The plant is located on a 240-acre tract just north of the Athens city limits.

Use of highly mechanized produc-

tion and materials-handling equipment and modern quality control techniques makes possible the economic, efficient production of high-quality, uniform transformers.

To minimize handling, the plant uses almost five miles of material-handling equipment of various kinds. These include in-floor tow lines, overhead monoveyors, power-and-free conveyors, and many special racks, trucks, and transfer devices.

The entire plant is laid out for straight-through flow of materials from receiving to shipping floor.

The receiving floor is arranged so that all materials used in each feeder section are stored at the head of this section. Incoming material proceeds in a straight-through flow from the incoming carrier through the receiving floor and into and through the manufacturing feeder section and on to other feeders or to final assembly.

Flow through the three major feeder areas — tank and core fabrication, and coil manufacture — results in finished tanks, cores, and coils. Then using a unique power-

and-free overhead conveyor system, these components are transported in the proper sequence and timing into a humidity-controlled room for final assembly operations, including core-coil assembly, tanking, evacuating and oil filling, and the finished transformer moved to tests, final paint touch-up, and crating.

As a result of continually expanding requirements of the electric utility industry for pole-type transformers, the new plant was built to supplement production at the company's two other distribution transformer plants — one at Sharon, Pa., the other at Sunnyvale, California.

## **Expansion at Henderson Clay**

Upon completion of the present expansion program during 1959, the **Henderson Clay Products** plant will become one of the largest and most modern of its kind in the entire Southwest with a daily production potential of 250,000 quality face brick per day.



# Question:

In Sewer Construction, Why Are 20-Foot Lengths of Pipe Better Than Short-Section Pipe?

# Answer:

When you specify and use the longer, 20-foot lengths of pipe you reduce the number of joints. This saves important construction time and dollars. And in the finished line it results in fewer points where infiltration might develop. \*



And if it's Armco Corrugated Metal Pipe or Armco SMOOTH-FLO® Sewer Pipe, you gain **extra** advantages of proved durability and dependable service through your nearby Armco representative and the fabricating facilities that back him up. Write us for details. Armco Drainage & Metal Products, Inc., P. O. Box 1343, Atlanta, Georgia, or C & I Life Building, Houston, Texas. Other offices in principal cities.

New steels are  
born at  
Armco

## ARMCO DRAINAGE & METAL PRODUCTS



*Subsidiary of ARMCO STEEL CORPORATION*

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company  
The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

## ***Southern News Briefs (Continued)***

### **Fifth National Symposium Meets May 18-20 in Houston**

Advances in analysis instrumentation applying to several branches of science and at least six industries will be unveiled in Houston, Tex. May 18-20 at the Fifth National Symposium on Instrumental Methods of Analysis sponsored by the **Instrument Society of America**.

Plans for the symposium in the Hotel Shamrock Hilton have been completed by a committee headed by Marvin D. Weiss of the Union Carbide Olefins Company and associate director of the Analysis Instrumentation Division of the society.

Many of the 30 symposium papers, although delivered primarily by authorities from chemical and petroleum companies, will apply to investigations in medicine and other sciences and to research and process

development in the food, nuclear, rubber, and plastics industries. Highlights of the meeting include: a discussion of cost-reductions made possible by specific applications of analysis as seen by K. V. Kratochvil of the Phillips Petroleum Co.; a survey of the latest developments in instrumental analysis by Dr. Donald D. DeFord of Northwestern University; general sessions on new design techniques in process instrumentation and on process chromatography; and chemical analysis and measurement with sea-going instruments designed to withstand the rigors of motion, vibration, and current fluctuation encountered in shipboard use will be described by two research scientists of the A&M College of Texas.

An exhibit of analytical instruments, sponsored by the Houston Section of the Instrument Society of America, will be another symposium feature.

### **Mine Safety Appliances — Tenn.**

**B. G. Tarkington** has been assigned as a safety products sales engineer in Memphis, Tenn., for **Mine Safety Appliances Company**, Pittsburgh.



He had been serving in a similar capacity in the North Little Rock, Ark., area.

### **Pennsalt — Fla.**

**Robert C. Kany**, 2651 Euston Road, Winter Park, Florida, has been named representative for **Pennsalt Chemical Corporation's** line of Corrosion Engineering Products in

Florida. He will handle Pennsalt's complete line of corrosion resistant mortars for bonding brick, tile and carbon shapes; plastic topping compounds for concrete; and plastics for the fabrication of process equipment used to handle corrosives.

Also, he will sell Penntrowel, Pennsalt's new surface coating for industrial and food processing plants.

### **B & W — Atlanta**

The Atlanta, Ga., district sales office of **The Babcock & Wilcox Company's** Tubular Products division has been moved to 464 The Peachtree Building, 805 Peachtree Street, N.E., Atlanta 8, Ga., from its former location at 830 West Peachtree Street, N.W.

### **Arro Expansion Bolt — South**

—Edgar J. Haas, Jr. & Associates of New Orleans, Louisiana has been appointed **Arro Expansion Bolt Company's** Sales Representative for the states of Arkansas, Louisiana, and Mississippi.

## **Combustion Acquires General Nuclear**

**Combustion Engineering, Inc.**, has acquired **General Nuclear Engineering Corporation**, a nuclear engineering and consulting firm headed by Dr. Walter H. Zinn. Dr. Zinn has been elected a vice president of Combustion and will be in charge of all the company's nuclear power activities. General Nuclear will be operated as a subsidiary of Combustion.



Dr. Zinn was the first director of the Atomic Energy Commission's Argonne National Laboratory. He served in that capacity from 1946 to 1956, resigning in the latter year to organize General Nuclear.

Combustion has been active in the nuclear field for more than twelve years and has a current backlog of nuclear work amounting to approximately \$50,000,000. The company has extensive facilities for the design, development, manufacture and testing of complete reactor systems, including both light and heavy components.

### **Rockwell — South**

**Edward Valves, Inc.** and **Republic Flow Meters Company**, both subsidiaries of **Rockwell Manufacturing Company**, have consolidated their offices with other Rockwell offices at 1495 Northside Drive N.W., Atlanta. Both firms will serve the utility and process industries in Georgia, South Carolina, Florida and southeast Mississippi from this office.

Edward Valves is a leading manufacturer of cast and forged high-pressure steel valves. Republic Flow Meters is a major producer of process instruments and controls.

## 6 Ljungstroms® go to work for the city of Memphis ...and so does lifetime Air Preheater service

The City of Memphis Light, Gas and Water Division has just installed three boilers served by six Ljungstrom preheaters. Why Ljungstrom preheaters? One reason is service. Air Preheater engineers don't just wait for a call. They regularly inspect and help maintain Ljungstroms *through the life of each unit.*

What's more, Air Preheater provides rapid *factory* service in an emergency. Here's an example. A customer phoned on a Friday morning for a

replacement trunnion—a major integral part of the preheaters. His Ljungstrom was 17 years old, which meant that a new trunnion had to be custom made to match his older-style. He was located 500 miles away. And he needed his boiler back on the line by Sunday.

Air Preheater went to work. Special trucking was arranged. The job was done *and shipped* that same evening. The customer had the trunnion by Saturday morning and the boiler was

back on the line by Saturday evening!

Fast response to emergencies and regular inspection of Ljungstrom installations are two of the many advantages Air Preheater provides its customers. Another is expert knowledge of boiler and preheater problems—and how to lick them—gained from over 35 years of experience. Perhaps these reasons explain why 9 out of 10 preheaters sold today are Ljungstroms. For further information write today for free illustrated brochure.

### THE AIR PREHEATER CORPORATION

60 East 42nd Street, New York 17, N. Y.

Ljungstrom rotor being installed for the City of Memphis Light, Gas and Water Division. Six such Ljungstroms—each with 201,400 sq ft of heating surface—will serve three boilers. The boilers will each evaporate 2,000,000 lbs of steam/hr and have a combined nameplate capacity of 750,000 kw. A fourth boiler unit is now under consideration. Burns and Roe, Inc. designed and supervised construction.



## Southern News Briefs (Continued)

### A. M. Byers — Fla.

Randolph R. Gustafson, 1780 Windsor Dr., Winter Park, Fla., has been assigned as a field service engineer for A. M. Byers Company.



Mr. Gustafson was formerly associated with Rust Engineering Co., Pittsburgh; Penn Metal Co., Inc., Parkersburg, W. Va., and Paul Smith Construction Co. and Mann Construction Co., Orlando, Fla.

### Ladish — Dallas

Ladish Co., Cudahy, Wisconsin, prominent manufacturer of pipe fittings, valves, drop forgings and rolled rings, has announced the establishment of a new sales office in Dallas, Texas — Room 1010, 211 North Ervay Building.

W. F. (Bill) Brockwell and R. O. (Bob) Barlen will represent Ladish in the Dallas area.

### A-C — Richmond

Bruce C. Halsted has been appointed manager of the Richmond,



Va. district of Allis-Chalmers Industries Group succeeding J. M. Mathews, resigned.

### Blaw-Knox — Ala.

D. B. Gooch Associates, Inc., 5018 First Avenue, North, Birmingham 12, Alabama, has been appointed District Sales Representatives of the Blaw-Knox Company, Buffalo Equipment Division.

Bufflovak manufactures a complete line of chemical, food, and petroleum processing plant equipment; such as, evaporators, dryers, autoclaves, flakers, kettles and gas cleaners.

### J & L Steel — La.

Richard C. Reed, Jr., 5247 Lakeside Drive, Port Arthur, Tex., has been appointed District Sales Manager of the Port Arthur, Tex., plant of the Container Division of Jones & Laughlin Steel Corporation, in addition to his duties as District Sales Manager of the New Orleans, La., plant.



Mr. Reed joined J&L in January, 1954, in the sales organization at the Port Arthur Container Division plant. He was transferred to New Orleans in February, 1956, and was appointed District Sales Manager in May of that year.

### A. M. Byers — N. C.

Union Supply Company, Durham, N. C., is now distributing new 4-D wrought iron pipe for A. M. Byers Company, Pittsburgh, world's largest producer of 4-D wrought iron products. Union Supply is marketing the corrosion resistant pipe in cooperation with Byers' division office in Atlanta, Ga.

### Southern Fab. — Sheffield, Ala.

Southern Fabricating Company, Inc., Sheffield, Alabama, has announced the appointment of John H. Horn as Director of Sales for its Welded Steel Tubing Division.



A native of Easton, Pennsylvania, Horn has been active in selling or in closely allied occupations since 1936. He has worked almost entirely with companies which produce and fabricate metals — in the South, the Middle West, New York, and New England.

Southern Fabricating Company, Inc., manufactures a complete line of welded steel tubing. The firm also maintains a large truck fleet, to provide it with control over its product from manufacture through delivery and to do away with lay-overs enroute.

### A-C Turbines for Ala. Power

Contracts for two hydraulic turbines have been awarded by Alabama Power Company to Allis-Chalmers Mfg. Co.

One, a 111,500-hp, 210-ft head, 138.5-rpm Francis runner type hydraulic turbine is for installation in the Lewis Smith hydro plant on the Sipsey Fork of the Black Warrior River. It is for an expected operating range of from 197 to 245 ft and will be supplied with water through a steel and concrete lined tunnel about 740 ft long and 25 ft inside diameter. Inlet to the turbine plate steel scroll case will be about 18 ft in diameter.

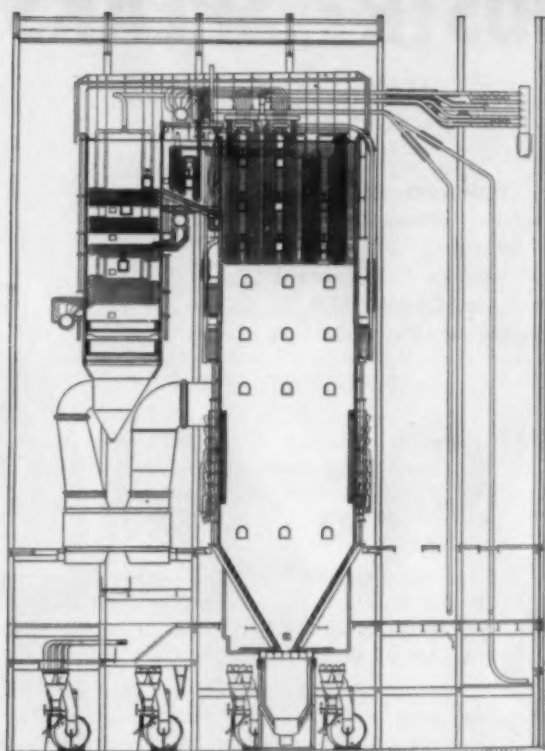
The hydro plant will be interconnected with Alabama Power Company's extensive transmission system and will supply peaking and regulating service to it.

The second award is for a 39,100-hp, 49-ft head, 90-rpm unit for concrete scroll case settings.





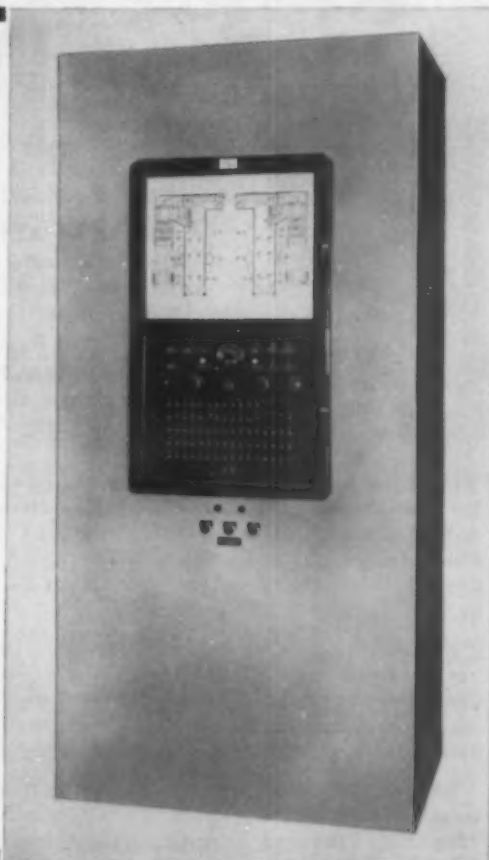
*How Copes-Vulcan control systems boost power plant efficiency*



□ Deslaggers

□ Long Retractable

Showcase super-critical steam generator will be equipped with a Selective-Sequence System that includes Vulcan T-30 long retractables with 30 to 37-foot travels, half 'tracts with 19-foot travels. Wall deslaggers and air-preheater cleaner controls will also be used.



Nerve center for precision boiler cleaning, the SSC-120 Selective-Sequence Controller is pre-wired and factory assembled for positive control. It handles up to four cycles for each blower. A 60-station model is also available.

## Vulcan soot blowing system saves steam, air and manpower

A Vulcan Selective-Sequence System gives the operator the ultimate in finger tip control of individual soot blowers. He can set up a sequence to assure thorough boiler cleaning and forget it. He can monitor the program at a glance, stop it, restart it or change any soot blower from any point in the sequence to another to improve cleaning or conserve the blowing medium. Here's complete flexibility without extensive time consuming wiring and piping changes.

Besides Selective-Sequence, Vulcan also builds Automatic-Sequential Systems that can use steam and/or air without a change in equipment, and can provide both simple automatic or manual control.

### A complete line . . . a complete service

Over 50 years of design experience backs Copes-Vulcan's broad line of control systems for boiler cleaning, combustion, feed water, pressure reducing and de-superheating.

Whether furnished in individual units or integrated into a single system, each installation gets custom design, skilled continuing service. Trained service men help set up a routine inspection-maintenance program . . . visit each installation periodically.

Bulletin 1029 details Vulcan Automatic Soot Blowing Systems. Write for your copy today.

**Copes-Vulcan Division**  
**BLAW-KNOX COMPANY**  
Erie 4, Pennsylvania



# INDUSTRY SPEAKS

**A NEW ATTITUDE TOWARD POLITICS,** coupled with positive and affirmative doctrines which fit acceptable national objectives, was urged upon businessmen in a recent speech at Raleigh, N. C., by **CRAWFORD H. GREENEWALT**, president of the Du Pont Company.

Indifference to political issues among businessmen has upset the historic balances essential to democracy. A list in any direction, if long protracted, brings distortions as well as inequities. Society itself is the loser. A heavy thumb on the scales can result only in short measure for the customer.

By presenting its own case in whispers, business has produced a social maladjustment for it is obviously essential that their point of view, representing the largest and most widespread influence in our national life, should be clearly expressed.

Businessmen cannot expect support unless they let it be known what they stand for. Government, like parenthood, requires personal attention and there can be no delegation of the responsibility to be responsible.

Closer contact and understanding offers the cure for hostile attitudes on both sides of the business-government relationship. Businessmen have too often approached politics more in anger than in reason, while politics has mistakenly looked askance at the business viewpoint. Actually, no representative business viewpoint exists and there are all manner of opinions to be found on public questions, even within a single corporation. Business people can, however, make constructive contributions to government, advancing the interests not simply of business, but of public welfare in general.

Politics is not an instrument of power; it is, first of all, an instrument of persuasion, of communication.

As business enters the political arena, it will perform its greatest service by restoring balance to the traditional American system. When the historic balances of the nation are in proper relation, rights are assured, excesses are curbed and they offset efforts by any group to benefit at the expense of the others.

An adequate balance among industry, agriculture, and all other pursuits has been at the heart of the

American economic system just as a consolidation of many diverse viewpoints has been the marrow of our political system. And the same need exists undiminished today in both categories, just as it has at all time in our history.

If the balances are to be preserved, all parties should be heard and considered. Yet business, in an era featured by shrill cries, has all too often pleaded its case in whispers.

Why businessmen should have been diffident about speaking out in defense of their cause is not apparent. Had the privilege of a hearing been removed by law, the injustice would have been decried as an outrage. Yet, as Mark Twain once said about reading, there is little difference between those who don't and those who can't.

What one must remember is that the other elements in the economic system which are actively promoting their own causes have every right — and indeed every responsibility — to do so. The cue for business is to add its own song to the chorus.

In our country, all decisions are made in accordance with popular will, and by and large, the public's verdict will be sound and just. But here, of course, there is one essential proviso, that the issue be clearly defined and that the voters be fully and completely informed of the facts. And it is here that business has the obligation and the duty to make sure that evidence is not withheld which would hinder the jury in reaching fair and equitable conclusions.

Obviously, business can justify no special privilege — the corporate citizen deserves neither more nor less at the hands of government than does the private citizen. And any corporate program, or program of participation by businessmen, will fail if it conceives its proper purpose to be the seeking of favors or of anything relieving business of its proper obligations. It can succeed only when its objectives are in accord with the highest ethical standards and its procedures are beyond reproach.

# "QUALITY and ECONOMY... SPANG Steel Pipe gave us both"

*says Mr. Joseph Yanasheski, Piping Estimator for  
Joseph A. Rado, Mechanical Contractor, Berwick, Pa.*

"One of the biggest problems in our business is to do a first-rate job and still keep costs in line," states Mr. Yanasheski. "With the help of SPANG CW Steel Pipe we were able to do just that at the Berwick, Pennsylvania, Hospital installation. Not only did SPANG Steel Pipe assure us of a reliable performance, but also the economy of using steel pipe helped us keep costs down.

"Another advantage to using SPANG Steel Pipe is its good welding qualities. By welding instead of threading the pipe, we achieved a considerable savings in

time costs and eliminated the danger of leakage at the joints."

## KEEP YOUR INSTALLATION COSTS DOWN, TOO... WITH SPANG CW STEEL PIPE

When you use SPANG CW Steel Pipe you get *top-quality*, money-saving performance. Why? Because SPANG Pipe is *quality-controlled* during manufacturing and thoroughly tested before shipping. Your SPANG Distributor can give you the fast, efficient service you require. Next job, make it steel pipe... make it SPANG.



## THE NATIONAL SUPPLY COMPANY

Subsidiary of Armco Steel Corporation



TWO GATEWAY CENTER, PITTSBURGH, PA.

20,000 feet of SPANG CW Steel Pipe fulfilled all the pipe requirements for the Berwick Hospital... in the air conditioning and heating units, sterilizer room and laundry. Here in the 40' x 65' boiler room, the SPANG Pipe runs in the ceiling so that there is no interference with the concrete-laying operation during construction.

### Mechanical Contractor:

Joseph A. Rado, Berwick, Pa.

Architect: Nokes and Neubauer, Washington, D.C.

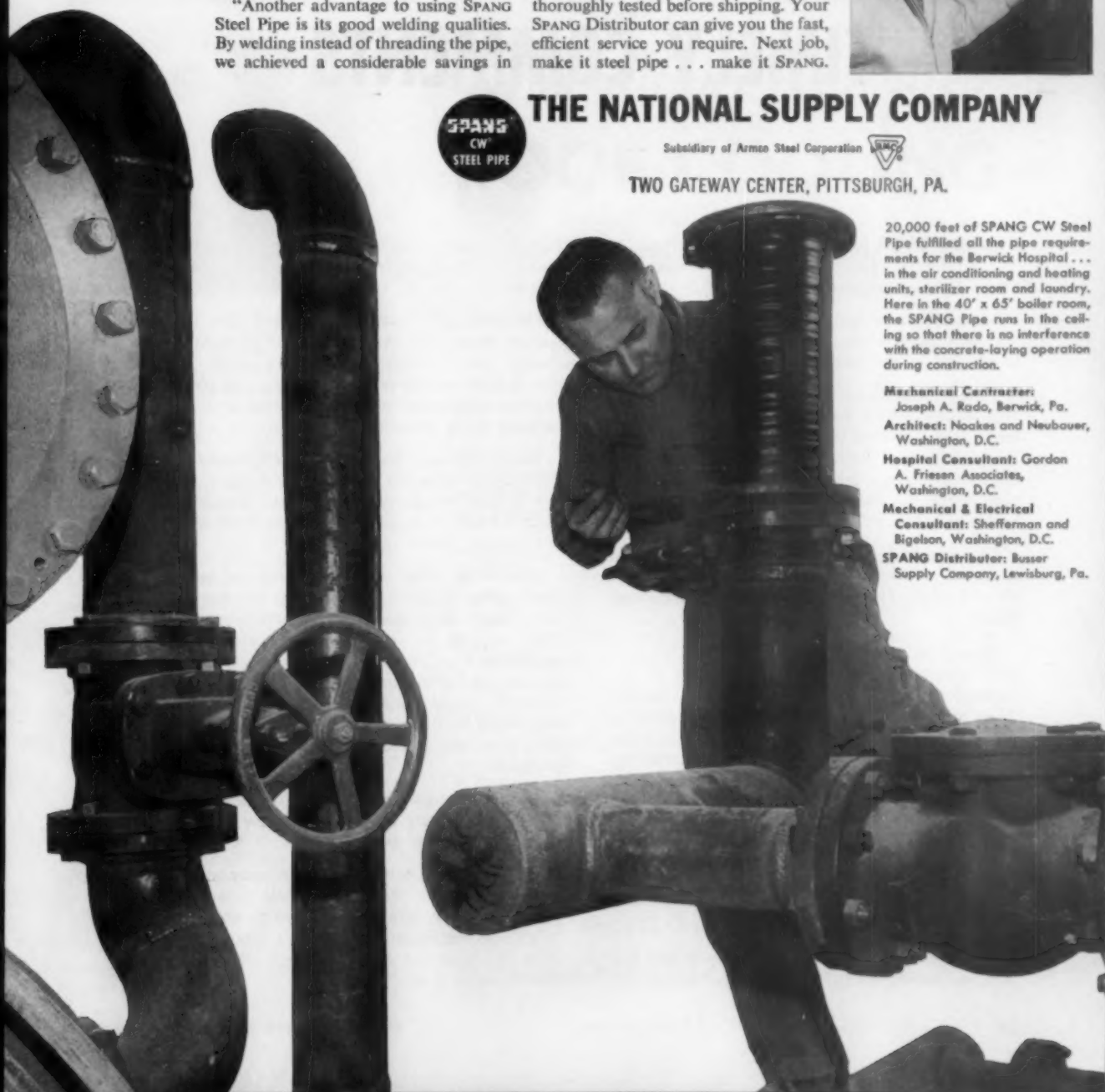
### Hospital Consultant:

Gordon A. Friesen Associates, Washington, D.C.

### Mechanical & Electrical

Consultant: Shefferman and Bigelson, Washington, D.C.

SPANG Distributor: Busser Supply Company, Lewisburg, Pa.





## TIMELY COMMENTS

**DID YOU EVER** have your car break down in a remote, lonesome area — no phone, no filling station, no people to help you?

I hope it never happens to you, but if it does you will have to be able to "fix it" if you are to get out of the woods without suffering.

That's the position of many of our Southern and Southwestern engineers and maintenance men. They have to be able to "fix it" too, and they can't use "hay-wire" procedures on the expensive equipment in their care. They must plan ahead for such emergencies and be ready to make substantial repairs on short notice.

Consequently, plant men in our area have to be more resourceful and better informed than those holding comparable jobs in metropolitan areas.

Recognizing this need for self-sufficiency, SPI readers are particularly receptive to information in editorial and advertising pages. They don't see "factory men" every day to discuss their problems with, and in many areas there are no professional repair organizations nearby to "come quickly."

Our plants on the average have to be better staffed and better equipped than those located near big supply centers. They must have better plant shops and better mechanics. They have to keep better stocks of supplies and replacement parts.

They need complete service manuals and full information on every piece of equipment they

buy. And their dependence on equipment suppliers breeds strong friendships and strong prejudices.

All of these conditions and needs, and other factors peculiar to the South, tend to mold SPI readers into a friendly cooperative group. They like to keep posted on the problems and success of their neighbors — and they like to lend a helping hand wherever they can.

That is the spirit behind this ANNUAL MAINTENANCE issue. To a large extent the articles are written by our readers to help their neighbors. Nobody is trying to show-off or brag. All are seeking better methods.

Few of the ideas and procedures are unique. Most of the articles are practical because they show how conventional procedures were skillfully applied to solve especially troublesome problems. Few readers will need to call in specialists, or even turn to reference books, in order to understand the thoughts expressed. But taken as a package nearly every plant man will find aid toward solving his own plant problems.

Every subscriber should scan the entire issue and read carefully only those articles "that provide meat for his own table."

Don't overlook the extensive sections on "New Equipment" and "Catalogs." Items in both sections have been carefully selected by the editors to go into the maintenance man's reference file. And, of course, our advertisers are always anxious to serve you.





An April Showers' double deck spray head in action. Photo above shows extensive installation on roof of Columbia Products Company, subsidiary of Shakespere Company, Columbia, S. C.

For information and free estimates call:

**APRIL SHOWERS—SOUTHERN**

Reube O. Emery, Regional Director, Third National Bank Bldg., Nashville 3, Tenn. — ALpine 5-8531

**ATLANTA** — William F. Applegarth, 1011 Marietta St., N.W. — TR 5-7751

**BIRMINGHAM** — Brownlee-Morrow Engineering Co., Box 3081 — LYric 2-8143

**JACKSON** — Robert Porter, 414 S. State — FL 5-0061

**KNOXVILLE** — Joe Bailey, Mechanical Equipment Co., 718 Market, S.W. — 4-1169

**LITTLE ROCK** — Ross S. Woodbury, T. J. O'Brien Engineering Co. — FRanklin 6-1068

**MEMPHIS** — T. J. O'Brien Engineering Co., 668 S. Main — JAckson 6-0339

**ORANGEBURG** — R. C. Dukes, Edisto Engineers, Jefferson 4-1521

**RALEIGH** — Charles Smith, Edisto Engineers, Milburn Rd. — Vance 9-4597

Have you read North Carolina State's report on "Scientific Roof Spraying With Engineered Systems"?

## *automatically controlled* **ROOF COOLING** by **APRIL SHOWERS—SOUTHERN**

**BEFORE YOU BUY** air conditioning (or if you don't) be sure to investigate automatically controlled ROOF COOLING by April Showers—Southern.

Millions of feet of April Showers' automatic roof spray systems are thoroughly plant-tested in the South-Southwest — cooling "under-roof" areas 8° to 15° . . . reducing loads of air conditioning systems as much as 25% . . . and adding life to built-up roofing materials.

Here are some of the many reasons why hundreds of Southern Companies have installed April Showers on their new and old buildings:

- Roof temperature never exceeds 8 to 10 degrees above existing wet bulb — in the South that means a roof is held at 90 to 95 F. Without April Showers, it would reach 150 - 160 F.
- Roof life is doubled — April Showers prevents quick temperature change shocks to built-up roofing, eliminating expansion, contraction, and volatilization of water-proofing compounds.
- Fire hazards are reduced and roof dust controlled. Built-in manual bypass permits spray operation at any time.
- Inexpensive to purchase and operate — thermostatically controlled with no pools, no run-off.
- Applicable to any design or type of roof.

**This is April Showers—Southern**  
*"Automatic Roof Cooling at Its Best"*

**COOLING TOWER INSPECTION RECORD**

Date \_\_\_\_\_ Tower No. \_\_\_\_\_ Plant \_\_\_\_\_  
 Manufacturer \_\_\_\_\_ Year Built \_\_\_\_\_ No. of Cells \_\_\_\_\_  
 No. of Fans \_\_\_\_\_ Fan Diam. \_\_\_\_\_ Fan RPM \_\_\_\_\_  
 Motor H.P. \_\_\_\_\_ Motor RPM \_\_\_\_\_ Tower GPM (Design) \_\_\_\_\_  
 DESIGN: Cold Water Temp. \_\_\_\_\_ Range \_\_\_\_\_ Type Treatment \_\_\_\_\_  
 Type of Wood \_\_\_\_\_ Bolts \_\_\_\_\_ Hardware \_\_\_\_\_  
 Nails \_\_\_\_\_

**RECORD OF INSPECTION**

1. Air Inlet Louvers  
 Are air inlet louvers in place? \_\_\_\_\_  
 Are louvers free from objectionable deposits? \_\_\_\_\_  
 Comments: \_\_\_\_\_

2. Basin  
 Is the basin leaking at any point? \_\_\_\_\_  
 Is there evidence of sulfate attack? \_\_\_\_\_  
 Does basin need cleaning? \_\_\_\_\_  
 When was basin last cleaned? \_\_\_\_\_  
 Comments: \_\_\_\_\_

3. Casing  
 Is the casing leaking? \_\_\_\_\_  
 Are the boards loose or missing? \_\_\_\_\_  
 Is resurfacing needed? \_\_\_\_\_  
 Comments: \_\_\_\_\_

4. Diffusion Decks  
 Is the water flow evenly distributed over each cell? \_\_\_\_\_  
 Are diffusion decks in place? \_\_\_\_\_  
 Are the supports in place? \_\_\_\_\_

**7 PAGE REPORT**  
 This is page 1 of 7 sheets covering  
 inspection of cooling towers.  
 If you want a full set  
 write the editors.

# The Station INSPECTION



**By S. L. TERRY**  
 Southwestern Public Service Company,  
 Amarillo, Texas

**INSPECTION** of central station equipment to determine the results of water treatment practices is a procedure which is carried out in detail each time the equipment is available to the person or persons who establish or control station water treatment practices.

A systematic and uniform system of recording the condition of

such equipment is extremely beneficial because of several important points. Such points as:

1. Many items of station equipment are available for inspection only once each year. At this time a carefully thought out record sheet serves also as a check sheet and eliminates the possibility of overlooking the inspection of spots which may indicate the first ap-

The author is a graduate chemist from West Texas State College. He was first employed by Southwestern Public Service Company as Plant Chemist in 1942 and has been with them since that time. His present duties, as Senior Engineer, include preparation of paint specifications for power plant maintenance and for new plant construction.

## 7 PAGE REPORT

This is page 1 of 7 sheets covering inspection of boilers. Other sheets are available. See note at end.

Southwestern PUBLIC SERVICE Company

BOILER INSPECTION RECORD

Date \_\_\_\_\_ Boiler No. \_\_\_\_\_ Plant \_\_\_\_\_

Manufacturer \_\_\_\_\_ Year Built \_\_\_\_\_ Serial No. \_\_\_\_\_

Operating Conditions: Pressure \_\_\_\_\_ Temp. \_\_\_\_\_ Capacity \_\_\_\_\_

RECORD OF INSPECTION

1. Air Preheater

Type \_\_\_\_\_

Section No. and/or Location: \_\_\_\_\_

Air Inlet Sections: \_\_\_\_\_

Is corrosion present? \_\_\_\_\_

What % of surface is affected? \_\_\_\_\_

Is corrosion slight or serious? \_\_\_\_\_

Flue Gas Sections: \_\_\_\_\_

Is corrosion present? \_\_\_\_\_

What % of surface is affected? \_\_\_\_\_

Is corrosion slight or serious? \_\_\_\_\_

Comments: \_\_\_\_\_

2. Attemperator

Are there deposits in the thermal sleeves? \_\_\_\_\_

Is there scale present on the tube bundles? \_\_\_\_\_

Examine a number of tubes where they pass through a tube support. Are they thinned or corroded at this point? \_\_\_\_\_

Is there any sign of pitting or etching on any of the surfaces? \_\_\_\_\_

If "yes", is there active corrosion, or is the condition due to old corrosion which is now inactive? \_\_\_\_\_

# Chemist's REPORTS

pearance of a problem.

2. Uniform records make the experience and findings of each station chemist or engineer available to personnel in other plants. Units of measure can be roughly established to describe the corrosion damage observed in a tank or the scale present in a hydrogen cooler, so that all can interpret and gain from the experience.

3. Procedures which are properly evaluated only after several years and many inspections can be followed with accuracy only when the records of inspection are uniform and complete.

4. Precise descriptions of water treating results will help prevent the loss of information as personnel turnover brings new men up to critical jobs.

5. Records of minor problems such as small amounts of copper in boiler deposits may in themselves be unimportant. But when several sets of records are compared, a pattern is often established which may lead to studies of the venting of extraction feed-water heaters just in time to save tube failures or just in time to indicate a change in alloy specifications for a new unit. Careful records may lead to valuable generalizations.

6. The value and convenience of the equipment inspection record form as a report to the supervisor will not, of course, be overlooked by the station chemist or engineer.

The preparation and use of

**FREE COPIES** of the author's working forms are offered to interested readers: 21 sheets that are proving effective in controlling damage in steam plants. Write the editors for a complete set of forms.

## RECORD FORMS AVAILABLE

Boilers .....	7 Sheets
Condensers .....	2 Sheets
Cooling Towers .....	7 Sheets
Heat Exchangers (evaporators, heaters, generator air coolers, hydrogen coolers, and oil coolers which use circulating water) .....	1 Sheet
Tanks (water, oil, acid, and air) .....	2 Sheets
Zeolite Softeners .....	2 Sheets

equipment inspection forms must be guided by the experience within the company as well as the experience of the industry. Recommendations of equipment manufacturers and their service men must be solicited and worked into the record form.

A conference of the individuals who record information on these forms must be held so that all inspectors agree on a uniform system of reporting intensity of corrosion, pit depths, etc. Also, training may be needed before each inspector is competent in finding and reporting such unusual problems as the presence of wood decay fungi in the fan support beams of a cooling tower.

This preparation seldom has to start from "scratch," however, because power plant organizations usually include chemists and en-

gineers who are experts in many or all phases of equipment inspection. Likewise, most companies have some system of inspection records.

Some time back, the ten plants in the Southwestern Public Service Co. adopted standard inspection report forms for each major item of plant equipment which is regularly inspected by the chemist or engineer in charge of water treatment.

Each plant now has an indexed book of record forms covering the inspections which are made during one year. These forms total 21 sheets as enumerated in the accompanying tabulation.

When the inspection year is completed the book, "Record of Equipment Inspections" for that year, is placed on the reference shelf and a new one is prepared for the

coming year. Frequent conferences, revisions, and additions help keep the methods of recording conditions as uniform as possible so that maximum system-wide benefits are obtained. The entire program is very well received in the plants where it is considered to be a simplification of the previous inspection records and more complete than most since it is actually a combination of all previous approaches. The time consumed in completing the record of a detailed boiler inspection is only about 15 minutes, so the paper work is not a burden.

Criticisms and suggestions are welcome and at the start of each year the forms are brought up-to-date and all known shortcomings of the system are remedied when possible.

*Single copy requests for full sets of the author's working forms (21 sheets) will be mailed at no charge as long as the editor's limited supply lasts. Make requests on company letterhead where possible.*

Write: SPI READER SERVICE  
Southern Power & Industry  
806 Peachtree St., N.E.  
Atlanta 8, Georgia

This is page 7 of the inspection sheets on boilers.

A		TUBE NO. FROM END OF PIPE TO END OF PIPE	TUBE SIZE	TUBE SCALE THICKNESS READINGS																										Remarks
				FEET FROM DRUM OR HEADER																										
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# Optimizing Instrument Maintenance

By **RALPH D. WEBB**  
Associate Director of Engineering  
Union Carbide Olefins Company  
South Charleston, West Virginia



The instrumentation engineer holds the key to low maintenance cost and good performance. No plant repairman can offset the inherent losses of poor design.

**INSTRUMENT** Maintenance Department organization has been described many times by persons more intimately connected with the problem than I. Therefore, I shall give attendance here principally to factors that are primarily the function of the instrumentation engineer rather than the instrument maintenance man. But I do want first to emphasize the importance of service and repairs, and comment briefly on Carbide's maintenance men.

In 1935 I started applying a crude aptitude test, plus a rather lengthy personal interview, to each applicant for the job of instrument repairman. Because of this careful selection, many non-technical instrument men with whom it has been my pleasure to associate in our South Charleston plant have proven to be thoughtful and intelligent and capable of functioning on a much higher level than normally expected of non-college men — all of this in a plant of highly complicated, very involved processes.

There are many dividends for this careful selection and training of the mechanic, one of the greatest of which is the fine engineers that are developed. Instrumenta-

tion engineers who have come up from the ranks of our South Charleston instrument organization are contributing much to the present progress of our corporation.

One of our "graduates" has just returned from having supervised instrumentation during the construction and start-up of a major petrochemical plant in Europe. Another has just returned from the task of putting into service the involved instrumentation in a polyethylene plant in Brazil. Still another is in charge of instrumentation engineering in one of our new U. S. major plants. And still another is in charge of all instrument service in our South Charleston complex which includes our Technical Center with its laboratories and pilot plants.

But it is my firm belief that it is the instrumentation engineer, the man who designs the measurement and control systems and specifies the instruments to be purchased, who actually is most responsible for the ultimate economy in the maintenance of plant

Mr. Webb has been with the Union Carbide Corporation since graduation from the University of Illinois with a B.S. degree in Mechanical Engineering in 1924. He has specialized in instrumentation engineering for the past twenty-five years and is now located at Carbide's Technical Center, South Charleston, West Virginia. He helped organize the Instruments and Regulators Division of A. S. M. E. and participated in founding the Instrument Society of America. He is a member of A. S. M. E., A. I. Ch. E., a Fellow in A. A. A. S., and an Honorary Member of the Instrument Society of America. He is a member of the Honors Committee and of the Dynamic Systems Committee of the I. R. D. of A. S. M. E. and of the Admissions Committee and the Society Structure and Planning Committee of I. S. A.

instrumentation. This is so, I feel, even though the engineers may have nothing to do with the selection and training of the men who actually operate and maintain the instruments or in the selection of the type of organization employed.

## Factory Consultation

For many years the instrument companies have very wisely sought and received the opinions and recommendations of the experienced instrumentation engineers of the user companies.

Many of us, particularly those who have had the benefits of plant Instrument Department experience, have made repeated trips

This article is based on a paper presented by Mr. Webb at the Instrumentation Symposium of A&M College of Texas on Jan. 22.

into the factories of the manufacturers and have spent days with their research and design groups explaining our needs, examining the manufacturers' newest developments, and in general making available to them the knowledge acquired through years of varied experience. Most of the instruments, valves, and auxiliary devices being used today in some degree reflect the results of these consultations.

The user companies can easily justify the expenses in both time and money involved in these trips through the assurance it gives of instruments better suited to their needs. And today maintenance in your plant is being benefited from much of this work. Because of it, you have instruments that are better enclosed, instruments more easily kept clean both externally and internally, mechanisms that are sturdier and more easily calibrated, as well as more accessible. You have assemblies that are better even down to such minor details as requiring but a single type of screwdriver or a single size of wrench for adjustments, replacements, or overhaul.

### Specifications

Another influence that the instrumentation engineer has on instrument design, and subsequently on instrument maintenance, comes through the purchase specifications. These can be set up only by an instrumentation engineer. In his efforts to meet the performance specification, which should be a part of the purchase specifications, the manufacturer often refines his design or his manufacturing procedure and so produces a better instrument.

This very thing has certainly given us improvements in accuracy, response rates, and general performance, and has also been a major factor in producing devices more resistant to environmental conditions, such as vibration, extreme temperatures, or corrosive atmospheres.

In particular, these user specifications, set up by engineers, have been responsible for better motor valves, valves with properly sized springs, better stuffing boxes of

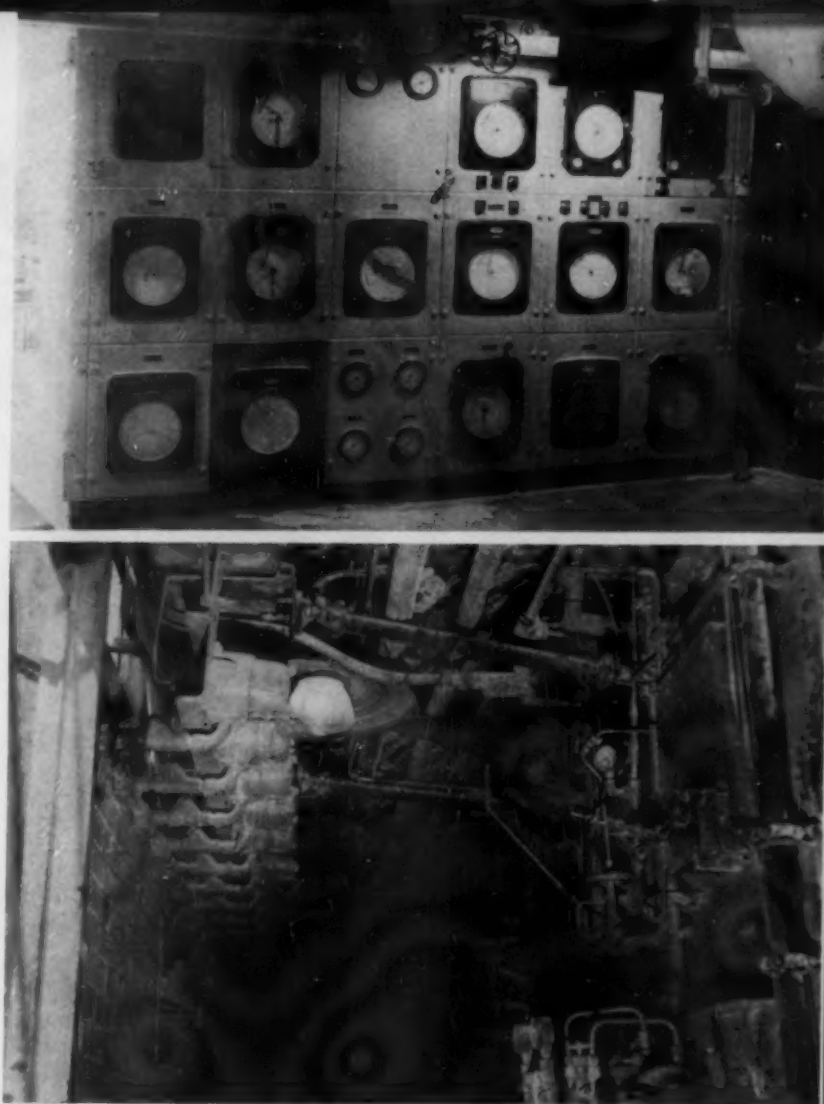
low friction and long trouble-free life, and with integral stem and inner valve design and guided plugs made to very close tolerances. I do not want to give the impression that I think all these were necessarily ideas of the user, but I do feel that good specifications by some of the major users were instrumental in causing several valve manufacturers to set up standards and controls that produced much better motor valves.

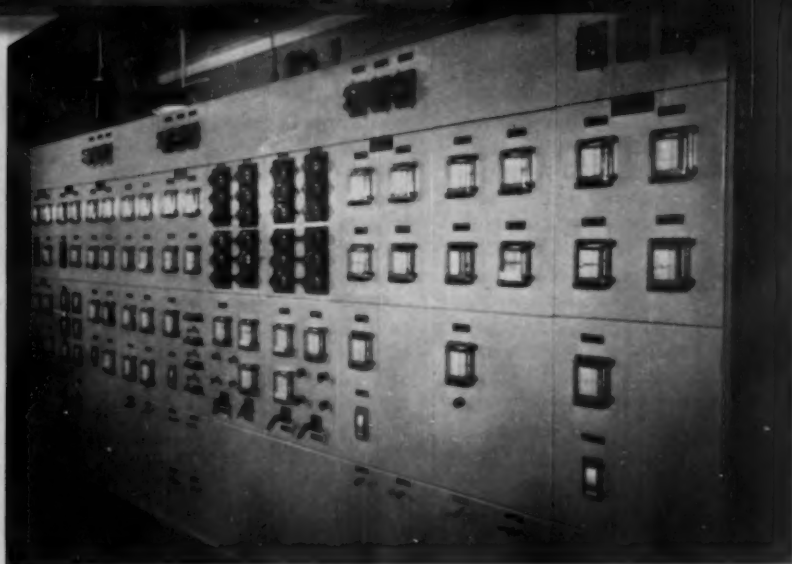
A look at the instruments that have been put on the market these past few years will reveal that, regardless of whether pneumatically or electrically actuated, provision has been made for the quick and easy change of the controlling or the recording mechanism. This has come about through a need

recognized by the instrumentation engineers in both the instrument-using and the instrument-manufacturing companies.

Because of this quick-change feature we can today employ what I like to call the "telephone company type" of service to instruments. Thus, the field men need carry only a few tools and perform only a few prefatory tests. Then, if necessary, new components are installed rather than having to tear down and repair at once as has been past practice. By its very nature, this type of procedure produces minimum disturbance to the operating unit.

Perhaps most important today, though, is the fact that the field man need not necessarily be a highly trained, well-rounded, skill-





## New Design Cuts Maintenance 75%

**THESE VIEWS** from one of Union Carbide's plants show a control center before and after the installation was redesigned by plant instrumentation engineers.

Photos at left show front and back of one of the five old panels. Overhead piping had become cluttered over the years and long leads were used to carry pressure to monometers mounted on the boards. Alarms and safety devices had been stuck willy-nilly all over the place.

The above view shows the new control room which is designed for use of miniature instruments and takes place of all five of the original panels.

The view at right shows the rear of the new panel. Here the environment permits the repairman to make accurate settings and calibrations, and its orderliness and cleanliness encourage high grade craftsmanship.

Correct mounting of transmitters eliminated the thermal



and pressure leads formerly required, and need for checking was greatly reduced.

The primary objective of better plant performance was attained. But of almost equal importance was reduced maintenance. Maintenance time on the new system is one-fourth of what it had been. This alone is 15% return on the new investment.

ed technician. Further, rather than being subject to the hurried field repair, the removed parts can be given a thorough shop overhaul by skilled mechanics who are equipped with adequate auxiliary instruments. And if, for instance, it is desired to try a different mode of control — say, to add derivative — it can be done in but a minute's time and with minimum possibility of causing leaks, friction, incorrect action, or other time-consuming troubles.

### Installation Standards

Most process industries use installation standards for various instrumentation items. Standards, carefully developed by the instrumentation engineers, help assure that primary measurement elements are properly installed,

that leads are properly sloped, that transmitters and exposed instrument items are properly housed, that case purges are used in zones of corrosive atmospheres, and that the thousand and one things needed to make instruments function properly are incorporated into the actual installation.

Correct standards will assure that motor valves are installed so the valve positioner is accessible, that clearance is provided below the valve body so the inner valve can be withdrawn without removing the whole valve, and that such obvious but easily overlooked items as spool pieces next to the valve flanges are provided to allow for bolt withdrawal. They will likewise tend to prevent valves and thermowells from being located in absolutely inaccessible places,

as well as prevent the omission of connections and pressure gauges at blind transmitters.

### Selection and Testing

Had I based this point upon its importance, I would have put it first. Instrumentation items should be selected by the instrumentation engineer and not by any one who is less familiar with instruments and instrument usage.

Now, this selection, which is so important to low cost and efficient maintenance of instruments, should be based on several important factors rather than first cost alone.

Remembering that both mechanics and supervisors of the plant Instrument Department must have knowledge and know-how about each type of device in the



plant and that the storeroom must have parts for it, the engineer should think twice before putting one, or several, odd variety of instruments in the plant "just for trial." The trial or testing of a device should be done in an evaluation laboratory or should be a special installation in some existing or older plant where it can be subjected to test procedure rather than being treated as a permanent installation.

The engineer, in selecting instruments, should be sure that they have properties that will give satisfactory performance in their final environment. This may call for the instruments to have the ability to withstand vibration, to accurately measure or control while undergoing rapid changes in temperature (perhaps actual sprinkling with water or other liquids), and the occasional horizontal rain or dust storm.

Motor valves need careful consideration of each individual element. The stem packing must be protected from extremes in temperature, and of course, the packing material must be suited to the fluid, as should the sealing grease, if used. The selection of the inner valve and seats, both in regard to material as well as design, should be made with shutoff, flow characteristics, erosion, and corrosion factors all in mind. Careful sizing of the valve is important, too, as it can influence its ultimate performance and life.

I have just mentioned the undesirability of using the new plant as a testing laboratory for the untried instrument or valve. This thought can be expanded into showing the benefits of keeping the brands installed in any one plant to a reasonable minimum. Such a policy is unquestionably hard on the instrument manufacturer whose instrument you do not buy; nevertheless, from the maintenance point of view, it is a good policy. Maintenance problems would be reduced if but one brand of instrument and one brand of transmitter and one brand of motor valve were used throughout a plant, but unfortunately, or perhaps fortunately, this goal is seldom achieved.

You will occasionally be forced

to depart from this policy by such factors as inability to obtain parts or an unfavorable change in the pricing or quality of parts, or the special cases where particular instruments fit in better than do the others. A reasonable compromise can normally be achieved but the maintenance problem should never be overlooked.

### Installation Sketches

All of us have seen installations where performance was marginal simply because the installers were not given sufficient information to do an intelligent job. The fault may lie in the location of the thermal bulb; maybe the controller should have been mounted at the process rather than behind the control panel; perhaps the leads of a differential pressure instrument should have been installed with a purge. Sometimes devices that should have had one side close-connected to a vessel are installed above, below, or some distance away from that vessel.

Installation sketches, supplementing the installation standards and made to fit the particular situation, will eliminate much of this trouble. Sketches should be drawn up at the time the engineer designs the measurement and/or control system and specifies the instruments so they may be properly utilized by the equipment, piping, and instrument layout men, as well as by the plant design draftsmen.

Through the use of installation sketches the instrumentation engineer can readily convey his ideas to all persons concerned. Here he will show the use or nonuse of gas purge, the relative position of the various elements involved, the dimensions of the connections for level or interface measurement, the location of thermal elements, the sampling point for analytical instruments, and the other vital details necessary for proper performance.

Sketches can be the means of having an instrument system installed in the manner originally intended by the designing instrumentation engineer, and the time required to make them is paid for many times over by the aid that the sketches give the draftsmen,

installing engineers, and others involved in getting the instrument ready for service. The greatest profit from their use is derived, however, by the Instrument Department which is responsible for service once the unit or plant is started. Too often, poor measurement and poor control are endured for months or even years because of the difficulty of making needed changes after operation starts.

### Sampling Systems

Plant-type analytical instrumentation is becoming more common and more important. The instrumentation engineer who selects a device of this type should also make the sampling system a part of his work.

As you know, the problems of proper sampling for plant-type analyzers have been subject to whole symposia and are surely worthy of special attention. A poor sampling system is often responsible for unsatisfactory plant analyzer performance and, therefore, becomes another problem for the Instrument Department.

Installation sketches could prove adequate on some of the simpler installations, but, as you will observe from literature on this subject, the designs often become very involved, incorporating scrubbers, traps, heat exchangers, filters, dryers, and all sorts of regulators and seals. Regardless, the instrumentation engineer should accept as his responsibility the furnishing of a design for a proper sampling system.

Often the analyzer manufacturer will be glad to cooperate — in fact, may be glad to furnish most of the design — knowing, as he does, the importance of good samples to the ultimate performance of his instrument. If the analyzer is part of a control loop, the sampling lag must be taken into full consideration in this design, or else the Instrument Department will face another time-consuming problem.

Control room design and layout, again an engineer's function, can materially affect instrument maintenance. Adequate and safe access to the back of the control panels is required if the mechanic is to function properly. If the



mechanic must crawl into a small, dark space, probably hot beyond all reason and dangerous because of poor exit facilities, he can hardly be expected to do a fast or a first-class job of adjustment or repair. The designing engineer must see to it that he has a reasonably decent environment in which to function.

This same consideration certainly holds for the console type of installation. I know of two specific cases in boiler houses where the mechanic reached the instruments by means of standing on a ladder from the floor below and working up through an opening in the operating room floor. Having no ventilation, this was an oppressively hot place where the mechanic soon became thoroughly soaked with his own perspiration. To add to the hazards, bare electrical connections carrying 120 volt alarm circuits were located on all sides.

In the first place, no person should ever be asked to work under such dangerous and uncomfortable conditions, and, in the second, maintenance of such instrumentation can never be kept on the same plane as if it had been made properly accessible. In your efforts to achieve compactness and good appearance, don't forget that provision must be made for the comfortable servicing of all of the devices involved.

#### Information Feedback

The final step in achieving installations that will give the best chance of good performance with a minimum of care is that of giving the instrumentation engineer the opportunity of not only checking all blueprints drawn up on new plant design, but also of personally seeing the instrumentation during several stages of installation. Then, if within reason at all, he should have the opportunity of being present at start-up of the units so he can see the performance of the instrumentation he designed. This is all part of the feedback that we know is so essential if we would grow, and improve in our methods.

A report of some sort, preferably a rather formal one, should be

written by the engineer. Part of the information for this report may be based on the fact that the instruments were not installed as intended, and it is through this that improved procedures can be established to minimize this all too common trouble. Most of the information should come from the Instrument Department actually operating the measurement and control systems in the new installation, for it is they who will be most aware of the poor performance.

#### Improving Existing Plants

Improvements to existing plants also constitute an important field

in which the instrumentation engineer can function to favorably affect plant instrument maintenance. Practically every point that has been covered above will also apply to the alterations and small changes that continuously go on in existing operating plants.

I have repeatedly witnessed cases where the plant instrumentation engineers have made instrumentation improvements that greatly reduced maintenance at the same time the primary aim of better production was attained. The accompanying photographs and captions illustrate an actual example of such an improvement in one of our plants.

#### Summary

1 — The first point made in this article — that of working with the instrument manufacturer in the development and design of his instruments — is one that is probably reserved for the more experienced of the instrumentation engineers.

2 — Good purchase specifications enhance the likelihood of your obtaining good instruments.

3 — Installation standards are needed, regardless of the size of the organization, if for no other reason than uniformity from one installation to the next.

4 — The careful selection of the instruments for the job and realization that new plants should not be used as test laboratories are important in achieving our goal

of optimal maintenance.

5 — The individual installation sketches, the checking of the instrument drawings before they reach the field, the personal supervision during construction and start-up, and the feedback of information to the designing group all, through good engineering, materially help achieve good maintenance.

6 — By placing it last in this article I have tried to emphasize the importance of instrumentation engineering in the existing plant. Such engineering can uncover hidden problems. It can improve plant performance in many ways, and at the same time it can also help to achieve the goal of optional instrument maintenance.

## Largest Gas Turbine Ordered for New Orleans

**LARGEST** combustion gas turbine yet scheduled for installation in the United States has been ordered by the New Orleans Sewerage and Water Board from General Electric Company's Gas Turbine Department.

The unit, costing approximately \$2,000,000, is rated 20,200 kilowatts at standard conditions.

According to C. W. Elston, the Department General Manager, the combustion gas turbine-generator will firm up base power and meet peak demands of the expanding

utility system of the Sewerage and Water Board.

This gas turbine is specifically engineered for low cost power generation to meet peak demands for electricity. It is adapted from a 16,500 kilowatt, simple-cycle, single-shaft machine of which nine have already been ordered or installed.

The air-cooled, totally enclosed generator will be rated 23,765 kilovolt amperes, three phase, 25 cycles.

Shipment of the unit is scheduled for May, 1960.

# System Dependability in a Continuous Process Plant

By **RALPH N. PRICE**  
Superintendent of Maintenance  
Columbia-Southern Chemical Corporation  
Corpus Christi, Texas



**A COMMON PROBLEM** of continuous process industries is the establishment of the relative importance of separate pieces of equipment as a guide in attaining an acceptable system dependability. Most of us are familiar with the concept, and the mathematics involved, in determining the overall reliability of a system which has a given number of units and an average dependability expressed as a percent (see chart). We believe, however, that this is useful *only* as a concept and does not have a specific application in solving the basic problem of system reliability.

The equipment required in our plant to produce a major product is quite varied as to character, dependability, and importance. Thus, system reliability is a composite of several factors of such variety that a strictly mathematical approach is impractical.

We recognize that experienced production and maintenance people carry a reasonable picture of this composite reliability around in their heads. However, in a growing industry with rapid turnover these men move on to better

things and the younger people are not as well equipped to analyze the problems. Even in a more static situation the desirability of rotating people through production and maintenance makes a more formal approach to this problem highly desirable.

## Equipment Importance

In our plant we rate all production equipment as follows:

### EQUIPMENT IMPORTANCE INDEX

(Based on Max. Prod. rate)

1. Essential to the continued production of an important product.
2. Cuts production more than 50 per cent.
3. Cuts production 1/3 or less, but emergency failure will result in serious operating difficulties.
4. Small or negligible loss of production and/or some operating difficulties in case of erratic failure.
5. Completely spared with no loss of production or operating difficulty involved.

It will be noted that we did not insert a rating between "more than a 50% production loss" and "cuts

production 1/3 or less." This was done deliberately to "force" a rating into either a level 2 or a level 3. Of course, we recognize that these definitions are not unique and cannot be applied universally.

## Equipment Dependability

Now we come to the problem of rating this equipment on dependability. In our original approach we attempted to do this mathematically, but gave this up in favor of purely descriptive ratings. (We are still looking for a formula which will give us more exact mathematical ratings.)

We also decided, after considerable discussion, that it would be necessary to rate equipment separately as to the probability of erratic failure and on a schedule outage basis. Our ratings are as follows:

### PROBABILITY OF RANDOM (OR EMERGENCY) FAILURE

1. Negligible.
2. Remote, but possible.
3. History shows at least one erratic failure.
4. Occasional erratic failures.
5. Consistent erratic failures.

## SCHEDULED OUTAGES

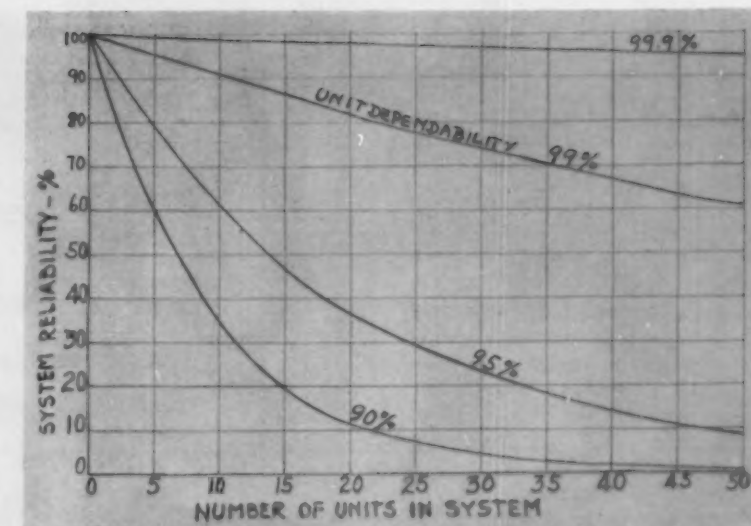
- A. None.
- B. Scheduled outage every five to ten years.
- C. Scheduled outage every two to five years.
- D. One scheduled outage a year.
- E. Several scheduled outages a year.

We found most production equipment fell readily into one of the above categories. Some difficulty was encountered in reaching complete agreement on a few pieces of complex equipment. This equipment was generally of major importance with numerous components of a varied nature. In the final analysis we believe both production and maintenance are satisfied that our equipment has been rated realistically.

### How It Works

How do we use this information? Well, it is fairly obvious that a unit with an importance level of "1" and a reliability rating of "5-E" should receive immediate, top level attention. On the other hand, an installation at any important level with a reliability rating of "1-A" can almost be forgotten. Fortunately in the first place, and unfortunately in the second, there are not many such installations.

An evaluation of this nature will direct attention immediately to the equipment which is the most im-



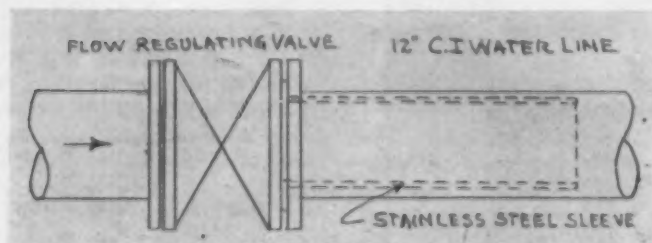
This familiar chart for determining overall reliability does not solve the basic problems.

portant to production and has the least reliability. It will also direct attention to the equipment where preventive maintenance and corrective maintenance will have the greatest potential for savings. Basically we are trying to improve the reliability of the weakest link — and thus make the whole system more dependable. Such evaluations, of course, are absolutely essential to the control and administration of any preventive maintenance program.

We also use these ratings for

spare parts control, and in determining the necessity for overtime and emergency work.

We emphasize again that there is nothing in these ratings which the old-timers don't know. However, we can all probably be compared to the farmer who didn't need any help from the agricultural agent — he "already wasn't farming as well as he knew how." And the information thus accumulated and formalized can be extremely valuable to the younger fellows as they come along.



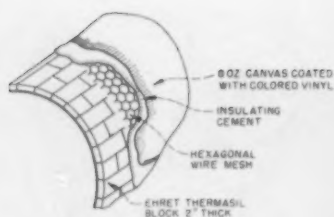
## Wear-Sleeves Protect Pipe

**GATE VALVES** are used to regulate flow in two 12-inch cast iron river water lines feeding the water treating plant of a Gulf Coast Chemical Plant. The turbu-

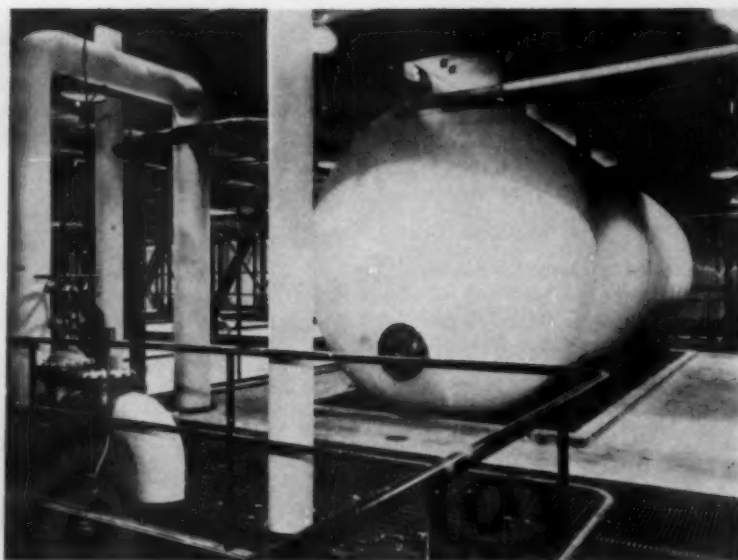
lence from the partially closed valves and the turbidity in the river water result in very severe erosion of the pipes just past the valves.

Stainless steel wear sleeves were installed to protect the pipe from further erosion. The sleeves were rolled from  $\frac{1}{4}$ " plate to fit the inside of the pipe and were about 30" long, with a flange to match the gasket face of the pipe flange. Since in this case, the erosion occurs over only about one-third of the inside circumference, the sleeve can be rotated as it becomes eroded to double or triple its life. These sleeves can be installed in a fraction of the time and cost of replacing a joint of cast iron pipe.

By N. W. WEAVER, Union Carbide Chemicals Company, Texas City, Texas.



At Virginia Electric & Power Co.'s new Yorktown Power Station, condensate storage tank at right is completely covered with 2-in. calcium silicate block. Auxiliary steam and blowdown lines at left are insulated with 85 per cent magnesia insulation. Diagram shows in detail how the condensate storage tank is insulated.



**Virginia Plant Aids Temperature Control and Conserves Heat with**

## Careful Insulation Application

**BECAUSE** insulation plays a vital role in temperature control, heat distribution and energy conservation at Virginia Electric & Power Co.'s new Yorktown Power Station, the selection and application of the insulating materials was given careful attention. In this new station all pipe lines, vessels and other powerhouse equipment are insulated with either calcium silicate, 85 per cent magnesia, or a combination of these materials. Selection was based on service requirements, line temperatures and pipe sizes.

Insulation specifications were developed by the power plant designers, Stone & Webster, and insulation was applied by C. E. Thurston and Sons, Inc., Norfolk, Va. Thurston is a distributor and installer of insulating materials

**By PETE THURSTON**  
C. E. Thurston & Sons, Inc.  
Norfolk, Va.

manufactured by Ehret Magnesia Manufacturing Co.

### Insulating Materials Selected

Two types of insulating materials were offered by C. E. Thurston & Sons for use throughout the Vepco plant: Thermasil calcium silicate; and Thermalite 85 per cent magnesia. Depending upon temperature conditions, service requirements and line size, these materials are either applied singly or in a double-layer arrangement.

Thermasil insulation is composed of hydrous calcium silicate, magnesia carbonate and a binding material. It was applied as a first layer for all high pressure steam

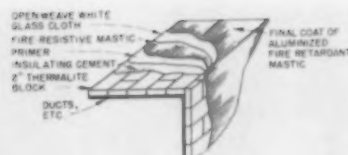
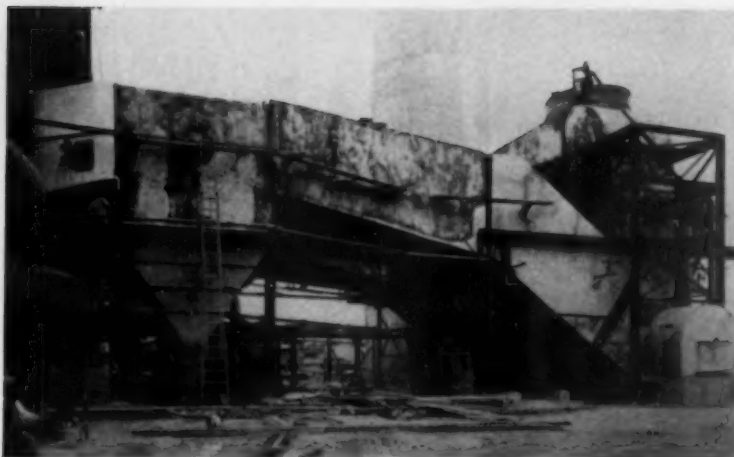
lines at the Yorktown Power Station — in sectional form to piping up to 18-in. diam, and in segmental form to lines over 18-in.

Pipe lines, ducts and vessels with temperatures ranging up to 550 F are insulated with Thermalite 85 per cent magnesia. This material is also used as a second, outer layer on higher temperature lines and vessels.

### Applied In Many Forms

Insulation types are chosen according to surface temperatures, but the form of the insulating material depends upon the size and configuration of the surface. All piping up to 18-in. diameter uses sectional insulation. This consists of half-round sections that are wired to the pipe. When more than one layer is used, the joints are staggered to reduce chances of





Outdoor ducts and breechings are covered with 2-in. 85 per cent magnesia block as shown at left in photo. Diagram shows how covering is applied to weatherproof the insulation and make painting unnecessary.

thermal leakage.

Piping above 18-in. diameter is covered with segmental insulation. With this material more than two sections are used to cover the 360 degree pipe surface. These segments are wired in place with all joints staggered both axially and circumferentially. After the insulation is wired to the pipe, a covering of 8-oz canvas is cemented over it with lagging adhesive. The line is finally painted with a colored, fire-retardant, water-base protective coating.

Vessels and tanks are covered

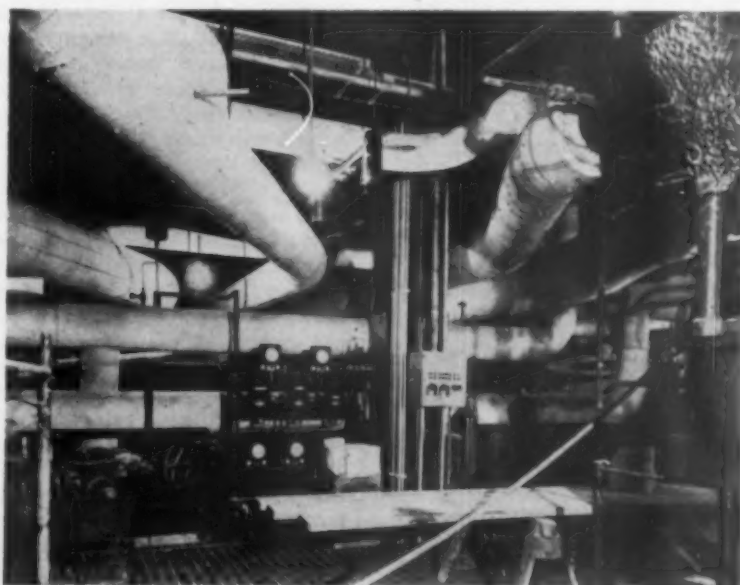
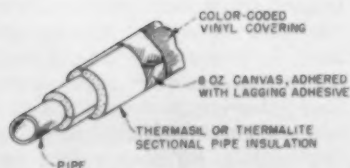
with block insulation, with joints also staggered. Block is then covered with hexagonal mesh chicken wire and covered with two layers of trowelled-on insulating cement. The first layer was applied with a rough finish and allowed to dry before the second layer was applied and trowelled smooth. An 8-oz canvas covering was applied to cover the entire surface, which was then painted with a colored, fire-retardant coating.

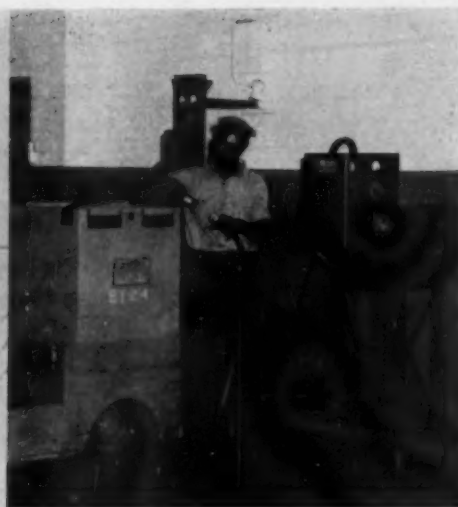
Outdoor ducts, breeching and fan housings received a different treatment. They were covered

with insulating block, cemented over with insulating cement. A coat of fire-retardant mastic primer was then painted on as a primer-sealer.

After heat was on in the system, the insulated surfaces were given a weather-protective coating as follows. First, a bedding coat of fire-retardant mastic was applied, with an imbedded layer of open-weave white glass cloth. A finish coat of aluminum-pigmented mastic was used to provide an aluminum surface that should never require painting.

Double layer of Ehret Thermasil calcium silicate covers main steam and high-temperature reheat lines shown here. After insulating, all lines are painted with a colored, fire-retardant, water-base protective coating. Diagram shows how lines are covered, with staggered joints to prevent thermal leakage.





Strict attention to details such as maintaining water level and a regular charging schedule help Reynolds of Winston-Salem keep a large factory truck fleet moving at minimum maintenance cost.

## Truck Maintenance Helps to Keep Cigarettes Moving

By GUY BROWNING ARTHUR

### THE R. J. REYNOLDS Tobacco

Company, at Winston-Salem, North Carolina, has hundreds of thousands of dollars invested in its battery powered fork truck fleet which is kept on the job by a well organized system of maintenance and repair.

The size of the job may be expressed as the company's volume in a recent year of \$957,366,846, with net earnings of nearly \$62 million. On the average day, over 1½ million dollars is paid to the U. S. Treasury for Federal tax stamps.

The products are not heavy, as industrial products go. They are packed for shipment in attractive cases which must not be damaged. The ideal handling method is on pallets.

The short runs of 400 to 500 feet must be made quickly by any kind of truck, but this is not enough. The demand is for fast time for an entire round trip. That means quick turn-arounds and

quick acceleration. The operator must get instant response when he drops a pallet in a car, whirls around for the return trip, and noses his forks under another load. And freedom from fumes and vapors is essential in certain areas of truck use. Battery-powered trucks meet these requirements. Low cost of maintenance and operation is outstanding.

### Maintenance

No matter how the trucks might be powered, it is constant, unremitting maintenance that keeps them on the job. There is no let-up in their service, which is tough for any machine. Responsibility for all maintenance is in the Engineering Department. It ranges from minor adjustments while in service to repairs or complete overhaul in the shop.

It begins with recharging. Each truck has its own recharger, and at the end of each day it is parked at its recharging station. Before

going home the truck operator looks the machine over casually to find anything that might cause trouble, and then hooks up the recharger. When the battery is charged up to full strength the automatic cut-off stops the charging and the truck is ready for the next day's work. Normally a truck can work eight hours without recharging, but it is recharged at the end of the day if it has run only a short time.

Preventive maintenance begins with minor adjustments made while a truck is in service and this strict recharging schedule and casual inspections at night.

Every truck is taken out of service once a month for a thorough check. It may get adjustments and tuning, and go back to work at once. If one becomes disabled while in service, or the monthly inspection shows the need for more work, it is held out of service for whatever is required, which could mean a complete overhaul.

This maintenance system is taken very seriously. It makes the system successful. Unless downtime and the cost of up-keep are held to a minimum the system would fail. Low-cost operation and long life are gained with this meticulous checking, inspecting and overhauling. No more care is re-

quired for these battery-powered fork lift trucks than for the same number of machines of any other kind, but no investment in hundreds of machines can pay off unless they are kept on the job.

No one type or brand of trucks or batteries is favored to exclu-

sion of others. They are purchased discriminatingly, however, for dependable long-time service. Several brand names are found in the fleet. It is tough competition for a truck and its battery. Long experience with many kinds of units has built up a high standard of

expected performance.

There are a number of shipping rooms, all under the direction of W. C. Loman, Superintendent of the Shipping Division. Each room has its own loading dock, and its own fleet of trucks with their rechargers.

## Transite Replaces Metal Pipe



Photo at left shows the corroded distribution pipe taken from the tower. View at right shows some of the risers in place.

**REPLACEMENT** of cooling tower distribution piping became necessary in our No. 3 Cooling Tower. It was observed that inlet temperature to the condenser was above normal, which affected No. 6 unit back pressure as well as generator cooler performance.

This piping was 16" lightweight spiral weld metal that was installed in 1950 when the tower was built. After a close check we found that each pipe had rusted out from the entrance to the tower to the wooden distribution flume in the center. This was allowing hot water from the condenser to go into the cooling tower basin without benefit of cooling, since part of the water was going out through holes in the pipe instead of through the wooden distribution system and spray nozzles.

Ernest Shafer, Plant Mgr., decided to replace the piping with

16" Johns Manville transite pipe instead of metal pipe, due to transite's non-corrosive characteristics, plus the fact that the cost of this material compared favorably with metal.

Since we had to keep the tower in operation we were required to take out only one cell at a time and hold the capability of No. 6 unit at not over 18,000 kw.

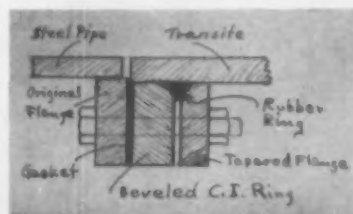
We decided to make our own transite to metal adapter and this turned out to be the most important part of this project due to the workmanship that went into making the adapter. We knew it had to fit exactly to specifications to keep the pipes together and not have any leaks. Due to the cost and time we were unable to purchase the adapters to meet our needs so we decided on this one which actually meets our requirements.

Our plant machinist, Albert Thornbro, made the adapters, see sketch. Due to the length of the pipe sections, one cut was required to give desired total length. This was done with a power saw with masonry blade, which proved very effective.

The next problem was to get the heavy 16" transite into the tower and get the old pipe out. A section of the tower wall was taken out around the cell entrance, and a scaffold was built and lowered from the top of the tower down to work area so one man could stand and direct the hoisting operation.

We used a truck with an A-frame, borrowed from our Substation department, to do the hoisting job. This not only gave us the means to do the hoisting easily, but also was a safety factor in allowing the work to be done in a safe manner. With some experience, we were able to complete a cell in one day's time, and the work proceeded without a hitch.

By **BOB McALISTER**, Plant Chemist, Roswell Power Plant, Roswell, New Mexico.



Sketch of how adapter was made.



Scale is removed from feedwater heaters.

## CHEMICAL CLEANING Handy Maintenance Tool

By **J. W. BRENNER**  
Richmond, Virginia

and

**B. H. McDANIEL**  
Jacksonville, Florida

Dowell Division of  
The Dow Chemical Company

**CHEMICAL** cleaning, the use of solvents to remove undesirable scale deposits that reduce plant efficiency and production capacity, has become one of the most valuable maintenance tools available to the plant engineer. Recent developments in solvents, application techniques, and tools for applying solvents have adapted economical chemical cleaning methods to additional types of industrial equipment.

Plant engineers and maintenance supervisors faced with equipment cleaning problems may benefit from considering the use of a chemical cleaning contractor's services. Such an organization has both the specialized equipment and the know-how to handle all types of industrial cleaning situations. This experience offers maximum safety to equipment and personnel because these specialists know what types of solvents can be used on each type of equipment and how to handle each solvent safely.

In comparison with mechanical

methods, chemical cleaning offers many advantages. It usually requires less outage time, cleans more thoroughly, reaches ordinarily inaccessible parts of equipment more easily, and often costs less. An important further advantage is that the chemical cleaning service company's experienced engineers and equipment operators handle the actual cleaning, thus releasing the plant's skilled craftsmen for other work.

Chemical cleaning requires a minimum of equipment outage time because the solvents used react quickly with fouling deposits. In addition, cleaning solvents are usually circulated by special truck-mounted pumps, keeping fresh solvent in contact with deposits to remove them quickly. Heat is often used, also, to speed solvent reactions.

Solvents used in chemical cleaning are designed to clean portions of equipment that are difficult to reach, such as bends and elbows in piping, small openings, areas

with baffles, and other irregular surfaces. In many cases, such parts cannot be cleaned by mechanical methods without extensive dismantling.

Chemical cleaning is often less costly than mechanical cleaning because the hours or days of manual labor required by other methods are practically eliminated. When the increased production and decreased outage time made possible by chemical cleaning are evaluated, chemical cleaning is often far less expensive than other cleaning methods.

### Application

Chemical cleaning has many applications in every industrial plant. Practically every piece of equipment that is subject to scale or sludge deposits can be chemically cleaned. In addition, chemical cleaning is often used to remove mill scale from new equipment being placed in service. Among the types of equipment often cleaned are boilers, heat ex-



changers, water lines, product lines, sewers, storage tanks, cooling towers, condensers, piping systems, gas washers, process towers, process equipment, evaporators, and filter beds. Chemical methods are also used to stimulate plant water wells, thus increasing water production.

### Recent Advances

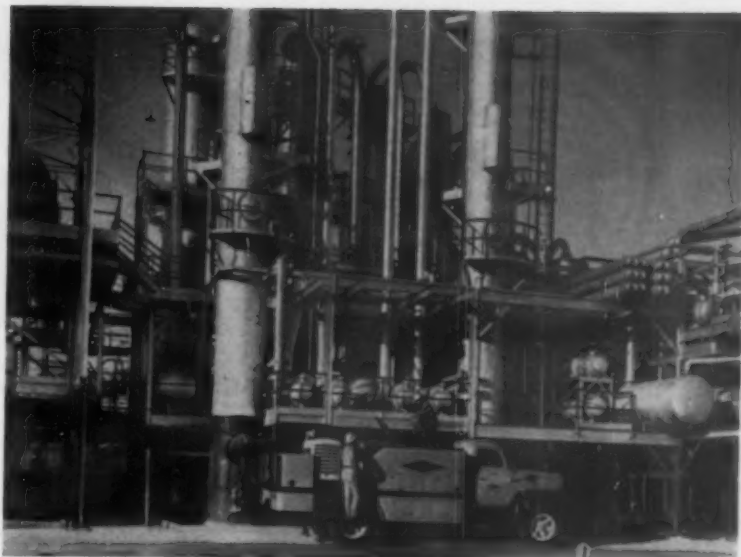
Many new advances in chemical cleaning have taken place recently. Improved inhibitors for acid solvents now give plant equipment better protection than ever before. Specialized solvents have been developed to handle difficult cleaning problems. One such specialized solvent safely removes both copper and scale deposits from boilers in a single-stage cleaning service.

Specialized tools have been designed to apply chemical solvents to many types of equipment that were difficult to clean previously. One such tool is the "Zingger," a revolving jet head which sprays a high-velocity solvent stream on all interior surfaces of equipment being cleaned. This device is powered by a hydraulic motor and can be controlled from outside the unit.

Another new tool developed recently, a "bundle cleaner," cleans tar, pitch, and other hard-to-remove deposits from the process sides of heat exchangers. This tool uses high-velocity water jets to remove troublesome deposits and restore the equipment's efficiency. The bundle cleaner speeds the removal of slow-dissolving deposits, eliminates lengthy soaking periods, and saves the cost of solvents.

New cleaning techniques devised for cleaning piping systems in rockets and missile-launching facilities provide standards of cleanliness that were unheard of previously. These high standards are necessary because particles as small as several microns in size could affect the performance of many missiles now being fired from launching pads at Cape Canaveral and other sites. Special solvents and equipment have been developed to meet these critical standards.

An essential ingredient of each chemical cleaning service is the experience of the chemical clean-



Scale removal job in a refinery.



Hydraulic jet bundle-cleaner.



Mill-scale cleaned from a new boiler.

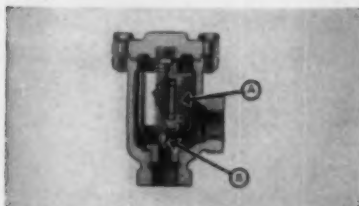
● A 24-in. waste line, buried ten feet underground, was obstructed by scale deposits that the plant operator had tried repeatedly to remove. Chemical cleaning service, using a special multiple-nozzle tool that emits high-velocity water jets, removed the deposits in only 16 hours. The line then easily handled all of the plant's waste water.

## Full-range steam traps cut high cost of steam pressure variations

By John W. Ritter, Test Engineer  
SARCO Company, Inc.

While boiler room economics dictate that boiler pressures remain constant, the equally sound economics of batch processing may decree that pressures at the equipment vary with the requirement of the process. The attempt to choose a steam trap that is all things to all conditions may result in installing traps that operate inefficiently at either extreme of their pressure range or that require adjustment every time the operations sheet calls for another pressure-temperature setting. Orifice traps represent a somewhat more rational approach to the problem, but often at the price of a continuous discharge of steam, particularly at the low pressures of start-up and shut down. Compromise, adjustment, and steam waste all spell inefficiency in the utilization of steam.

**Production-Planned** steam trapping, on the other hand, improves efficiency by the use of properly designed and installed thermostatic steam traps. Such traps employ the expansion and contraction of a thermostatic element to operate the discharge valve.

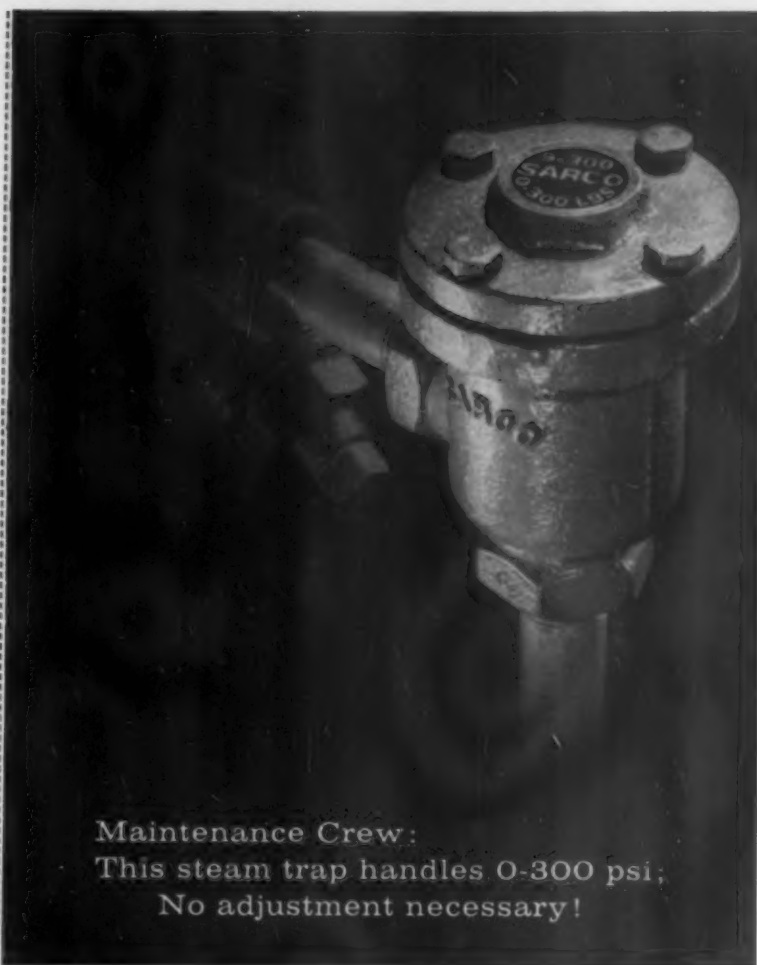


In Sarco Thermostatic Steam Trap, element (A) expands at steam temperature to close valve (B), contracts to permit discharge of condensate.

In the Sarco "Balanced Pressure" Thermostatic Steam Trap a volatile fluid is sealed inside a metal bellows that opens or closes the valve as it contracts or expands with condensate temperature. Near steam temperature, evaporation of the fluid creates an internal pressure greater than steam pressure in the trap body, and the expanding bellows seats the valve. When the condensate cools, the element contracts and opens the valve.

It is evident that at steam temperature pressure inside the element is higher than steam pressure, no matter how the latter may vary. Thus, the trap compensates automatically for variations in pressure.

58108



Maintenance Crew:  
This steam trap handles 0-300 psi;  
No adjustment necessary!

Sarco "Balanced Pressure" Thermostatic Steam Traps cut trap maintenance costs and simplify parts inventory. Why? Because the same bellows, head and seat handle steam pressures up to 300 psi — without any need of adjustment for variations in load or pressure.

Other advantages: unmatched capacity/cost ratio (1" size discharges 9,650 lbs/hr. at 10°F below steam temperature, 125 psi). This trap can't air-bind and, when installed with free discharge, can't freeze.

Long life and reliable performance are assured by an exclusive Sarco process for fabricating the one moving part — the thermostat — and by steam-testing of every single trap at maximum rated pressure.

Write for "Literature Kit 1A" today. And remember, Sarco can give you impartial advice on *Production-Planned* steam trapping because ...

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Only Sarco makes all 5 types:  
Thermostatic • Liquid Expansion • Float Thermostatic  
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**Ford Glass Plant . . . . . Nashville**

## Open Metal Flooring Aids Safety and Maintenance

**MORE AND MORE** safety conscious architects and engineers are specifying open metal flooring and treads for walking safety and low maintenance costs in industrial plants. Ford Motor Company is typical in that their new glass plant at Nashville, Tennessee contains some 35,000 square feet of Kerrigan Weldforged open steel flooring and stair treads. (See photo for a view of one of the stairs leading to the open flooring below.)

Safe movement of workers, hand trucks, etc., on three floors around the huge furnace is of utmost importance in this plant which is the world's largest complete glass-producing facility under one roof, containing 1,054,000 square feet of floor space and planned for capacity production requiring 2,500 employees.

Grating, or open metal flooring, contribute both to safety and low maintenance in the new Ford plant, as well as in thousands of

others across the country. Its open area improves circulation of light and air, and, because of its self-cleaning properties, collection of dirt, oil and grease is held to a minimum. Its high strength to weight ratio often means less support than other types of floors.

One-piece panels of grating are easy to install and can be put into use immediately. Grating is easily fabricated to provide openings for columns, pipes, etc., and is frequently used to provide easy access to heavy equipment which needs frequent servicing or inspection. In boiler rooms and other hot areas (for example, the area surrounding Ford's huge furnace) grating's open construction helps heat, dust and fumes to escape, thus keeping workers more comfortable and efficient.

In addition to the growing use of open steel grating, aluminum sparkproof and stainless steel are now being used where extreme corrosive conditions prevail.

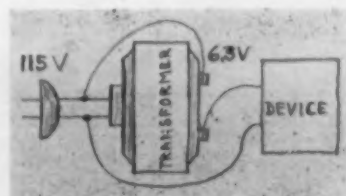
## Voltage Booster

**OUR PLANT** lighting system operates at 110 volts, but voltages may and do, drop to 100-105, and this interferes with the operation of some of the electronic devices hooked to the lines.

A simple rig ahead of such devices cures the trouble and boosts the voltage to the requisite value.

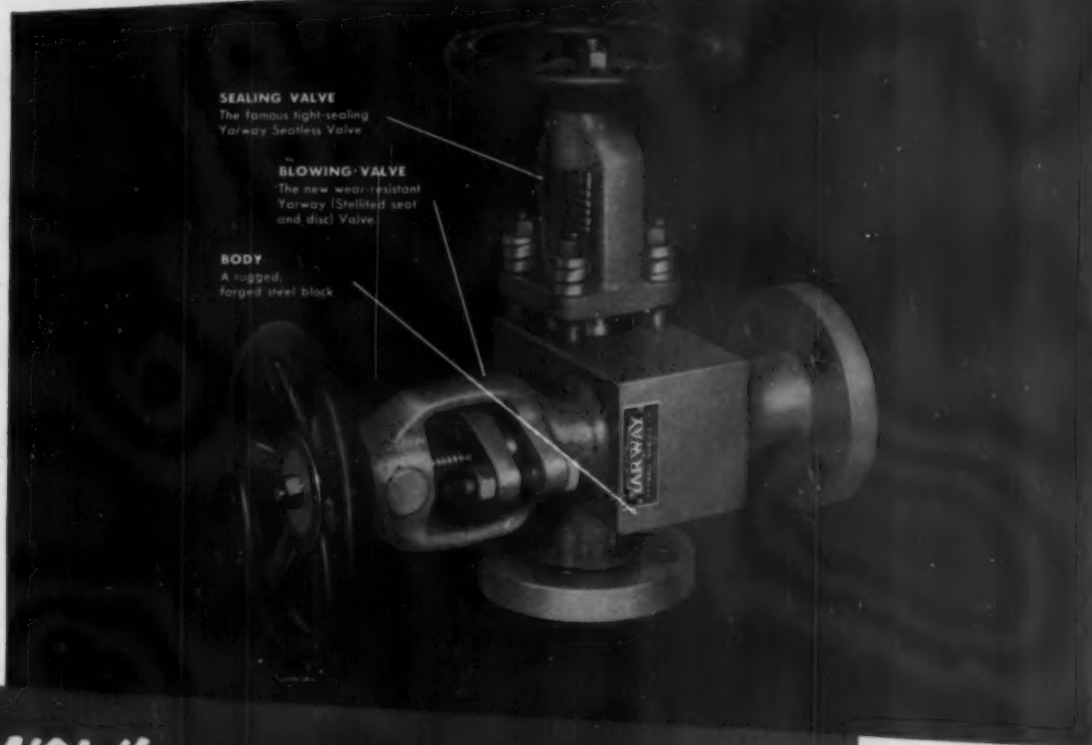
A small transformer such as those used to supply the filament in electronic equipment is hooked to the supply line of the device. This provides an extra 6.3 or more volts. If it subtracts from the line voltage by this amount, simply reverse the secondary terminals.

*By H. JOSEPHS*





## NEWS FROM YARWAY



### **NOW! A NEW YARWAY UNIT TANDEM BLOW-OFF VALVE FOR MEDIUM PRESSURE BOILERS**

There's a new star in the Yarway Blow-Off Valve line.

For years rugged Yarway Unit Tandem Blow-Off Valves have been standard equipment on most high pressure boilers. In fact, more than 80% of high pressure plants use Yarways.

Now a new design Unit Tandem is offered for medium pressure boilers to 665 WSP. Streamlined, lighter in weight, easy to operate, tight sealing and long wearing—this valve brings premium quality Yarway Unit Tandem dependability to the medium pressure field—at a competitive price!

Important features, like the nitralloy plunger in the sealing valve and integral stellite seat and disc in the blowing valve, make this your best buy for blow-off service.

Order Yarway Unit Tandems for your present boilers—or specify them on new boilers.

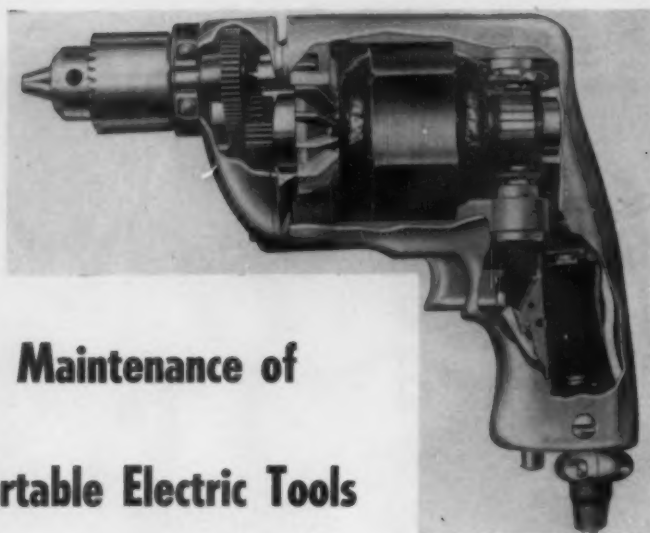
For full details write for Yarway Bulletin B-435, Supplement A.

#### **YARNALL-WARING COMPANY**

Home Office: 116 Mermaid Ave., Phila. 18, Pa.

Southern Office: Bona Allen Bldg., Atlanta 3, Ga.

# **YARWAY**



## Maintenance of Portable Electric Tools

**ALL HAND-OPERATED** electric tools follow the same general design pattern. The construction within the casting consists of three large parts: switch, motor, and gear assembly.

The most common motor used is the universal type, which gives the same performance on either alternating or direct current of 25 or 60 cycles. From the motor, reduction gearing drives a spindle to which is connected a chuck for drilling, a flexible pad and disc for sanding, or an abrasive wheel for grinding.

### Cleaning

Portable electric tools used to do abrasive work require more attention than others. Sanders, polishers, and grinders, by their very nature cause grit and dust to be in the air. Some of this foreign matter may get into the motor and brushes, causing wear or grounding if not removed periodically.

From time to time, with the tool running, an air hose should be held next to the intake ventilating openings to blow out the collected foreign material. If the tool is in constant use, it should be air hosed every two or three weeks — if used intermittently, once a month. When this care is neglected, new brushes or a complete overhaul job is sometimes needed sooner than expected.

Other portable electric tools such as drills, which create no great cloud of dust or foreign matter in their work, need an air hosing about every 90 days.

### Grounding

There is danger of a severe shock when operating a power tool in dampness or where abrasive dust is likely to create grounds, unless the tool has been properly grounded. Most power tools of recent manufacture are equipped with a three-pole attachment plug so that the grounding is automatically made when the plug is inserted in an outlet. An adaptor is available to compensate for an outlet with only two poles.

The majority of the portable electric tools sold today have shipped with them instructions for proper grounding of the tool. These should be followed carefully to avoid any chance of an electric shock. Under all circumstances, the grounding connection should be made before switching on the power supply.

### Lubrication

Although every electric tool comes lubricated from the manufacturer, the gears will need lubrication from time to time based on use. Clean out the old grease from the gear case and gears with a good solvent and refill according to the manufacturer's specifica-

tions. It is important to follow instructions, not filling the gear chamber more than  $\frac{1}{4}$  to  $\frac{2}{3}$  full. When grease is warm it expands, and if too much is used the excess may be forced through the bearings into the motor, damaging windings.

Unless bearings are "permanently" lubricated, they should be greased periodically. But a closed type, grease-sealed ball bearing should not be lubricated. Be sure that no solvent is allowed to get in the bearing and dilute the lubricant. Merely wipe it clean on the exposed surface.

### Cable

The cable of any electric tool is built strong by the manufacturer, and it will last a long time if it is not abused. It should be kept clean to avoid oils and greases ruining the rubber. Dragging it across rough or sharp surfaces might cut or slash it. Using it as a handle to carry the tool will strain the electrical connections.

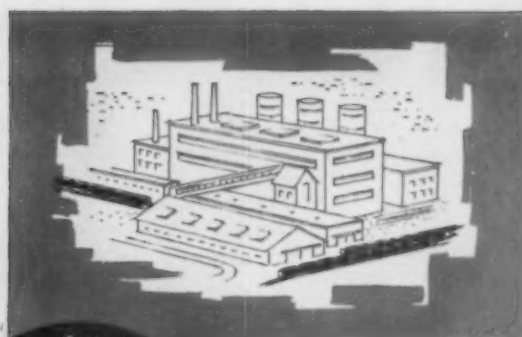
When an extension is needed to reach a particular job, be sure that a cable of adequate size is used to prevent excessive voltage drop. Cords such as those used on lamps and similar small appliances are not suitable.

If the voltage variation is much greater than 6% it affects the performance of the motor to a considerable extent. A 10% voltage drop will reduce the power of the motor about 20%, and the speed of operation will drop considerably. With a voltage increase, on the other hand, there will be an increase also of the current input and the speed of the tool, which may result in overheating the motor.

### Brushes

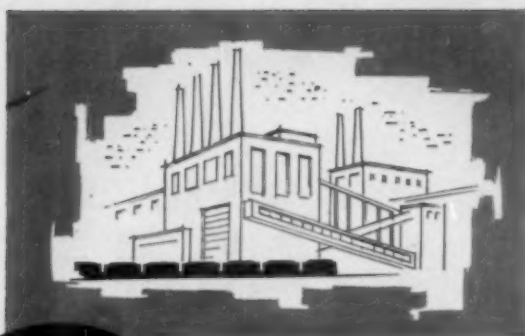
Brush neglect causes a major percentage of tool trouble. Brushes are sliding contact carbon blocks riding on the commutator of the motor armature. The armature is rotating at a high speed, and there is considerable friction between the brushes and commutator, causing the brushes to wear away. When too short, the spring tension that presses them against the commutator is reduced. This causes arcing, which in turn causes both

**FUEL SATISFACTION\***  
is a  
**Natural . . .**



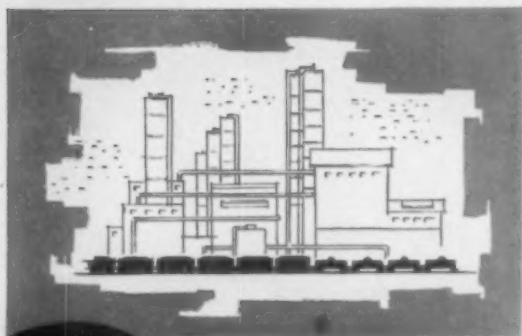
for  
**INDUSTRY  
and  
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**For Industry and Metallurgy!** Fuel Satisfaction coals are high in carbon content, low in ash and sulphur. They are unexcelled for metallurgy.



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● **ST. LOUIS**  
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Fuel Satisfaction coals are mined and processed along the Norfolk and Western and precision transported to meet your most exacting requirements. For details on these all-purpose coals get in touch with the Norfolk and Western Coal Bureau nearest you. They will welcome your inquiries.

\* FUEL SATISFACTION is the name given the many fine brands of superior all-purpose Bituminous Coal mined along the N&W.

**Norfolk and Western Railway**

CARRIER OF FUEL SATISFACTION

the brush and the commutator to burn or pit with chances of ruining the armature.

Brushes should be replaced when excessive sparking shows up, or when they have worn down to 3/16". A new brush of good quality is an inexpensive investment that reduces commutator wear and maintenance.

### Commutator

Commutators sometimes become corroded, covered with grease or

dirt, and pitted or worn from improper brush contacts. They can be cleaned with very fine sandpaper (00 grade). But never use emory cloth, and see that all sand is blown off.

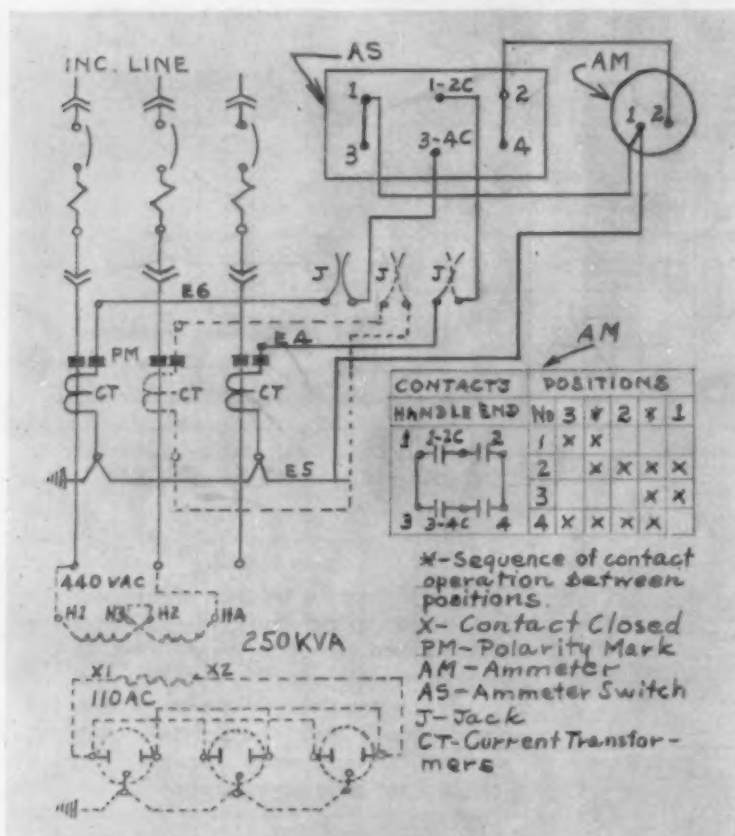
### Switches

Avoid opening the switch any more than is necessary when the motor is stalled. The switch contacts are subject to arcing when they are opened, and this may result in burning the contacts. Poor

contacts can make the switch stick — bad enough when it prevents turning the switch on, but dangerous if it sticks while the tool is running and it is imperative that it be switched off.

A switch with its contacts in good condition may stick or appear to be burned out because the operating mechanism has been damaged. Switches are inexpensive, and so are generally cheaper to replace than to repair.

Courtesy Black & Decker Mfg. Co.



Dotted lines indicate transformers, jack and 110 vac outlets added for recording ammeters. When using recording ammeters with this circuit, ammeter switch has to be either in No. 1 or No. 3 position.

## INDOOR SUB-STATION MAINTENANCE

**IN SETTING UP** a Preventive Maintenance Program in our plant, our load centers (indoor sub-stations) were scheduled to be checked semi-annually with

recording ammeters.

To accomplish this task, it was necessary to make temporary installation of recording ammeters during off duty hours as all serv-

ice had to be interrupted. During the outage, one clamp-on ammeter had to be installed; then to record all three phases the permanently mounted current transformers had to be disconnected from the load center ammeter and connected to recording ammeters used for checking. This procedure had to be reversed when removing recording ammeters.

All this required about 15 man-hours (at premium time) per load center at a cost of over \$900 per year for all 4 load centers in our plant.

It was suggested by the chief electrician that a third current transformer be installed, as well as ammeter jacks and 110 volt outlets to drive recording ammeter charts during tests. This panel was designed and fitted into our load centers by the plant chief electrician.

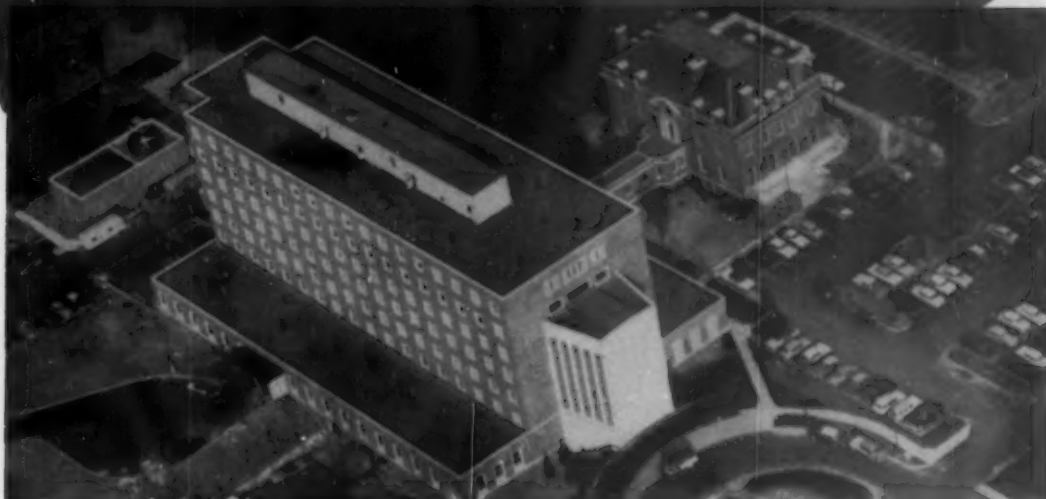
This arrangement has cut our installation time to 1/4 hour per load center, thus enabling us to cut recording ammeter installation cost approximately 97%. Now all that is required to install recording ammeters for the semi-annual check is to plug them in; this can be done during normal duty hours and without interrupting service.

By making these periodic surveys, we have a complete history of each load center (indoor sub-station). This enables us to keep track of load growth and load shifts. This also gives us a true picture as to our power requirements for future plant expansion.

By **JAMES W. TRUSLOW**,  
 Chief Electrician  
 General Electric Co. Plant  
 Waynesboro, Virginia



# MOGUL-IZING<sup>®</sup> protects new Richmond Memorial Hospital



Richmond Memorial Hospital, Richmond, Va.

The North American Mogul Products Co.  
Cleveland 13, Ohio

Gentlemen:

We have two 600 H.P. high pressure boilers that provide heat and steam for our buildings and a 500 ton Carrier chiller. Both are subject to rigorous demands since they operate day and night.

To protect this expensive equipment and assure uninterrupted service, good maintenance and correct operating procedures, proper water treatment for all units was of prime importance. In selecting chemical products for this purpose we chose Mogul for two reasons: (1) Proven protection and, (2) Prompt and courteous service by your local Mogul representative.

Among the products used in our plant are: Mogul M-16 and Mogul Amine in our boilers, Mogul M-12 to treat our Laundry water, Mogul M-12 and Mogul Algicide GM-2 for water chiller and cooling towers and Mogul Fuel Oil Treatment as additive for bunker-C oil.

Mogul products are doing an excellent job for us and should share honors with the plant personnel in making ours one of the model Hospitals in this area.

Sincerely,

*John W. LeFleur*

John W. LeFleur  
Superintendent of Buildings

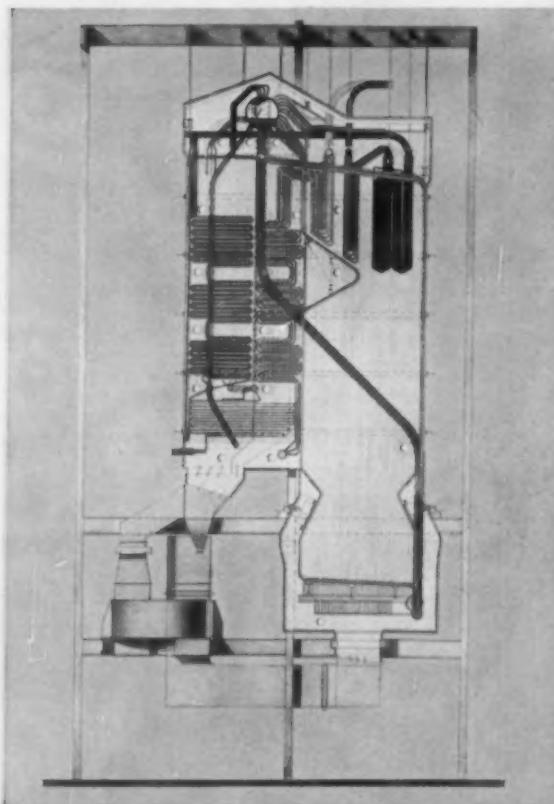
The North American  
**MOGUL**  
Products Company  
Standard Building • Cleveland 13, Ohio

\*This report from Richmond Memorial Hospital is one of many coming in from across the country. MOGUL-IZING your equipment with MOGUL products . . . backed by MOGUL field service is the combination that assures the best possible protection from the damaging effects of water . . . a complete, integrated water treatment program . . . Write, wire or phone and ask about the complete MOGUL-IZING plan for your plant or inquire about specific equipment protection. There is no obligation.

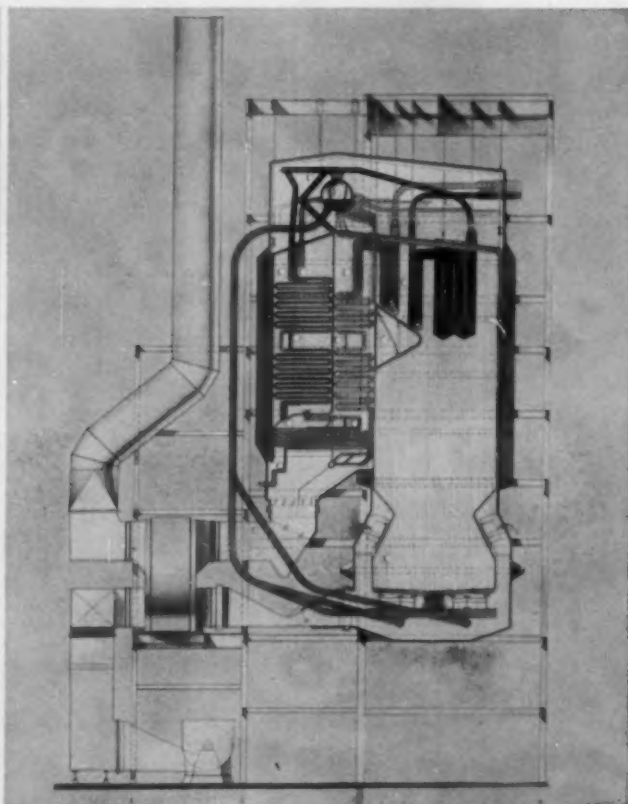
SPECIALISTS IN INDUSTRIAL WATER TREATMENT FOR OVER 40 YEARS

# **NOW** *Is The Time To Order New Steam Generating Capacity*

A new era of growth in the field of power generation is approaching . . . an era that promises to greatly increase the demand on manufacturers of steam and electrical generating equipment. Riley Stoker Corporation, having successfully met the challenge imposed by the remarkable growth of the past decade is now thoroughly prepared to meet the even greater challenge of the new era. Riley is fully staffed and manned in both engineering and manufacturing divisions. Orders placed **NOW** will be processed efficiently and quickly. Avoid the competition for delivery that may result if the inevitable order is delayed to a time when late delivery may result.

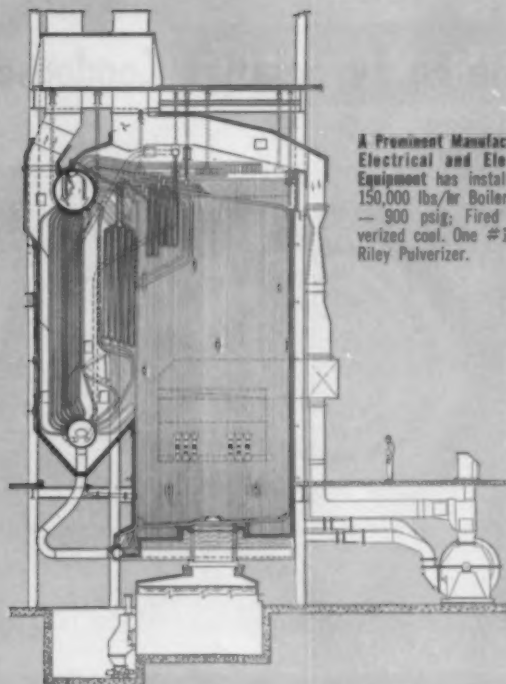
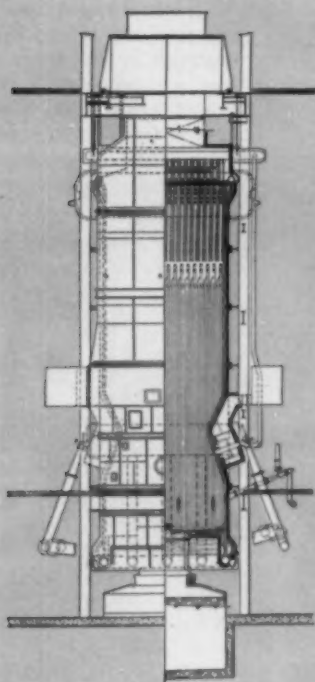


**TURBO FURNACE** Reheat Unit for **Florida Power Corporation** has capacity of 600,000 lbs/hr. 1750 Psi, 1000/1000 F. Fuels: oil, gas. Could convert to coal with minimum outage. **Black & Veatch.**



This Riley **TURBO FURNACE** Reheat Steam Generator for **Dallas Power & Light Company** is pressurized, has a steam capacity of 1,200,000 lbs/hr. 1005/1005 F. 2125 Psi. Will burn gas and oil initially and convert readily to lignite, coal in future. **Ebasco Services, Inc.**

## **RILEY** — **A One-Stop Source For Both Steam Generating And Fuel Burning Equipment**



A Prominent Manufacturer of Electrical and Electronic Equipment has installed this 150,000 lbs/hr Boiler: 835 F — 900 psig; Fired by pulverized coal. One #1 Duplex Riley Pulverizer.

#### **TURBO FURNACE BOILERS THOROUGHLY FIELD TESTED**

With the Riley Turbo Furnace thoroughly field tested you can specify the Riley Turbo Furnace Boiler with full confidence that it will live up to its superior performance characteristics. Turbo Furnace Boiler Designs are supplied with Reheat and Non-Reheat and with pressurized and non-pressurized furnaces.

#### **RILEY BOILERS GIVE SUPERIOR PERFORMANCE WHEN EQUIPPED WITH COMPLETE RILEY FUEL BURNING SYSTEMS**

Any fuel or any combination of fuels can be burned efficiently with Riley Boilers because Riley also manufactures a complete line of fuel burning products. For pulverizing coal Riley offers two types of mills: the Riley Pulverizer and the Riley Ball Tube Mill. These are used with either Riley Flare Type Gas/Oil/Coal Burners with Riley wall fired units, or with Riley multiple fuel Directional Flame Burners with the Turbo Furnaces. Riley also furnishes spreader stokers, traveling grate stokers and underfeed stokers. A Riley Boiler installation complete with Riley fuel burning equipment assures a contract of undivided responsibility.

*A survey of your plant by a qualified consulting engineer could show ways of making surprising savings in your power costs.*

#### **RILEY PROVIDES FULLY EQUIPPED AND SKILLED CONSTRUCTION SERVICES**

Riley Stoker Corporation supplies complete construction services with its equipment. Riley construction crews employ the latest in construction methods and techniques.

#### **EXPERIENCED SERVICE ENGINEERS ASSURE SAFE, DEPENDABLE AND EFFICIENT OPERATION OF RILEY BOILERS**

Riley Service Engineers are trained to provide prompt and efficient servicing of all Riley installations. These experienced engineers work closely with your operators to assure that your Riley equipment will operate at high efficiency for long uninterrupted periods of operation.

#### **YOU'LL FIND A RILEY REPRESENTATIVE IN EACH OF THESE PRINCIPLE CITIES:**

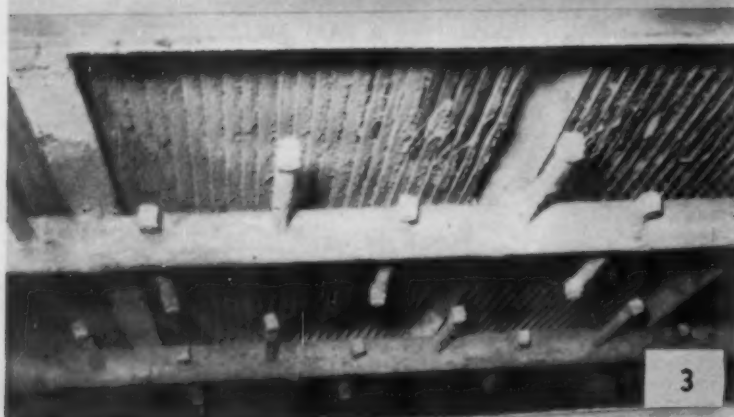
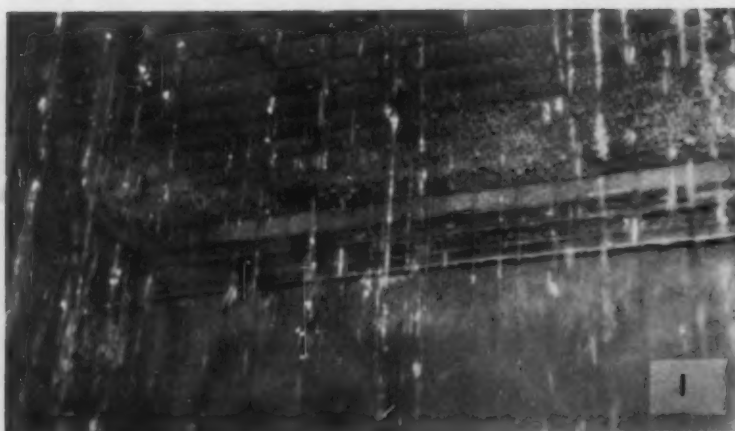
Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Jacksonville, Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Salt Lake City, San Francisco, Seattle, St. Louis, St. Paul, Syracuse, Worcester.



# **RILEY**

**STEAM GENERATING & FUEL BURNING EQUIPMENT**

## Scale on Evaporative Condenser Coils



**SCALE** on evaporative condenser coils either finned or non-finned type has caused many a plant engineer or maintenance crew to lose a good night's sleep in hot humid weather. Such has been the case in the East Tennessee institution which has as part of its equipment the evaporative condenser shown in picture No. 1.

Please note the very heavy scale deposits on the fin type coils with the coils actually "grown together" in areas at the extreme top left of the picture as well as the left rear and center rear of the picture.

This particular unit was operated for a number of years with no treatment and virtually no maintenance from the standpoint of washing out, bleeding off water to control dissolved solids, and other normal recognized maintenance procedures which any piece of equipment should be given.

We were called in by this particular firm to prescribe and outline a program to remove the existing scale deposits and reduce the existing critically high head pressure.

Immediately a "shock dosage" type of treatment program was begun to remove quickly and effectively a large quantity of existing deposits to reduce the high head pressure.

The volume of water contained in this unit was approximately 50 gallons. Ten pounds of a very effective calcium carbonate scale remover was added, and within 15 minutes, the head pressure had dropped 15 pounds. The head pressure initially was 188 pounds and was reduced to 173 pounds in 15 minutes.

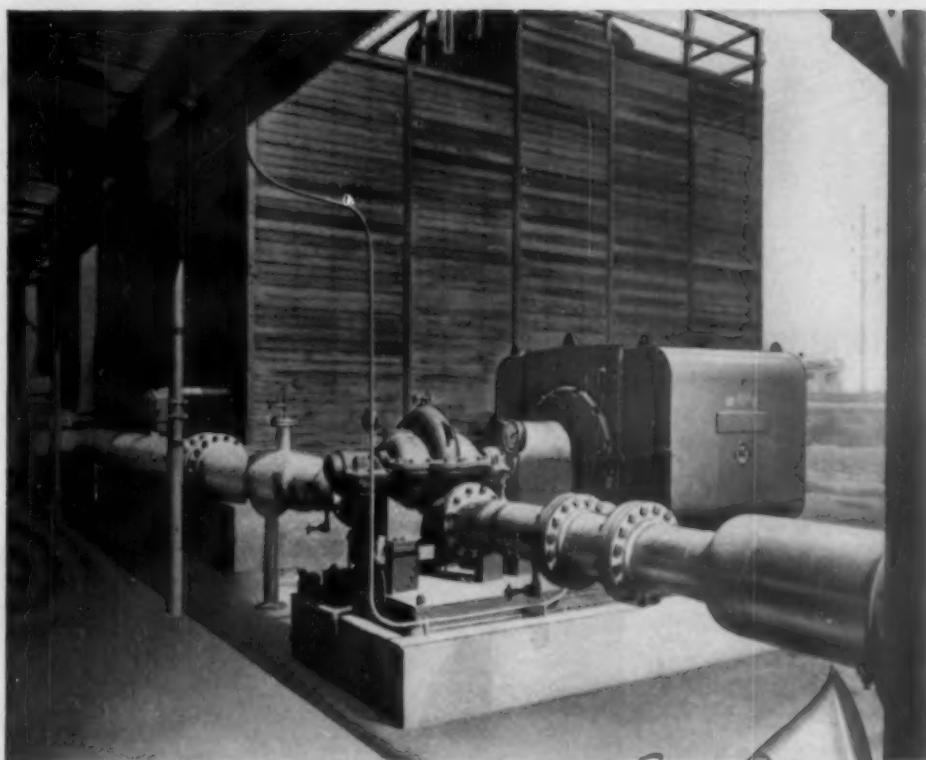
Larger dosages of chemicals than normal were added for a three week period in order to effect removal of existing deposits while the unit was in operation. Two and one-half weeks after the initial dosage of chemicals was added, one man working in the refrigeration room, for which this unit served, reported to the chief engineer that something was wrong with the refrigeration equipment. When the chief engineer asked what seemed to be the trouble, the man replied that all the milk was freezing and push-



ALLIS-CHALMERS

In pace with POWER...

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## CONTROL ALGAE easy, low-cost way



Eliminate problems of plugged pump strainers, coated heat-exchanger tubes and coated slots in cooling towers.

Control is safe . . . quick with Allis-Chalmers No. 120 Series Algaecide.

This algaecide is toxic to more algae than any other. On the other hand, it has low toxicity to fish or animals and is extremely safe to handle. Even in concentrated form it is only a mild irritant to skin and hands.

A little goes a long way! Only 2 to 5 ppm are required for effective dosage of most organisms. It's easy to feed into the system . . . and is non-oxidizing and corrosion inhibiting.

No water conditioning specialist needed to use it! Buy it and try it. Purchase directly from your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.



A-5972-FR

ing the bottle caps straight up.

Through the established treatment program, the scale continued to remove from the coils until now the unit is operating with 140 to 145 pounds head pressure and operating efficiently.

A regular scheduled maintenance program is now established in addition to the treatment program to keep the unit free and clean of scale.

Picture No. 2 illustrates how coils can be kept clean with a properly set up and controlled feedwater treatment program. The

coils noted in picture No. 2 are from a system that has had a regularly controlled treatment program for well over 10 years. Needless to say, this picture illustrates the very ideal conditions which can be obtained through proper treatment and controls.

Picture No. 3 shows the eliminators on a small cooling tower above the sprays as to the effect excessively high dissolved solids can have in a unit of this type. Some of the eliminators were so completely clogged with scale or deposited solids that only about

50% of the air could be pulled through the unit for which it was normally designed. The raw water used in this cooling tower condenser system is such that no treatment to prevent scale is necessary. An adjustment in dissolved solids concentration by bleeding was all that was necessary to keep not only the eliminators of the cooling tower but also the tubes of the shell and tube condenser itself clean and free from scale. By **CLYDE A. FARRIS, JR.**

*Water Services, Inc.  
Knoxville, Tennessee*

## Aluminum Condenser Tubes

**AN INCREASING** trend toward use of aluminum in the power generation field is typified by the acceptance of aluminum tubes for steam condensers. In some five years since the first aluminum-tubed condenser was installed by Aluminum Company of America at its own Sandow Power Station, Rockdale, Texas, an estimated one million pounds of aluminum tubes have been installed in power plant condensers.

Currently being installed is a 75,000 square foot condenser, shown here being tubed, for Unit Number 2 of the Armstrong Station of West Penn Power Company, Reesdale, Pa. Aluminum was chosen for the tubes after four-year exposure tests by Alcoa showed its suitability for handling Allegheny River water at that point. The installation follows a two-year joint development project between Alcoa and West Penn.

Aluminum was specified by the power company in order to effect substantial initial cost savings. The designer and builder of the condenser, Maryland Shipbuilding & Drydock Co., Baltimore, Md., also found that installation of the aluminum tubes was quicker and easier than a comparable installation of tubes of another material. One crew accomplished tubing of the condenser at a rate of better than 800 tubes per shift, using a water soluble lubricant. Some corrosion advantage from using the

aluminum tubes is anticipated, particularly on the steam side, since aluminum is suited for serv-

ice in the presence of ammonia and hydrogen sulfide.

The condenser is designed to handle 812,819 pounds of steam per hour, exhausted from a 156,250 kw Westinghouse turbine generator.



# The unseen enemy

How Summers Gyroscope guards against the invisible anti-missile

There is an invisible enemy operating in many plants producing the missile components, flight instruments, gyroscopes and other hyper-sensitive devices on which much of America's power for peace depends. The strength of this unseen foe is potentially as great as that of any anti-missile missile.

## Destroyer Of Standards

This reliability destroying, efficiency reducing enemy is dust, lint and other foreign matter. The slightest air borne contaminant coming to rest unseen on sensitive mechanisms during assembly can cause serious, even fatal deviations in performance. Production was often slowed until tests showed the system to be free of dust.

## Dust Moved But Not Removed

To combat the dust dilemma at the Summers Gyroscope Co. plant in Santa Monica, California, personnel donned lint free jackets and hats — walked to their work benches in shoe bags. Temperature and humidity were controlled in an attempt to achieve an environment completely free of every possible contaminant ranging from stray hairs to perspiration. However, these precautions proved only partially successful when it was found that a manual dust gathering system in the final assembly "clean room" actually recirculated dust instead of removing it.

Note how the Hoffman vacuum system handles both parts cleaning, (rear) and housekeeping chores.



## Double Duty Production Tool

For a solution to the dust menace, Summers called upon U.S. Hoffman Machinery Corp., pioneers in the use of air as a production tool. Hoffman engineers installed a permanent stationary vacuum cleaning system which provided for necessary cleaning operations at all of the 240 individual work benches in the 12,000 square foot final assembly area. Standard attachments made this same system available for cleaning overhead and under foot, all over the plant.

## Before And After

Prior to the installation of the Hoffman stationary system, relative cleanliness tests were conducted. A microscopic analysis of slides revealed lint, dust and other foreign matter in excess of quantities allowable to maintain Summers' high precision standards. A short time after the Hoffman equipment was placed in operation, the same tests showed a truly dust free "clean room".

## How It Operates

Heart of the stationary cleaning system at the Summers plant is a 60 hp Hoffman centrifugal exhauster producing the vacuum. A centrally located dust separator outside the assembly rooms collects the material with large filtering area insuring thorough cleaning of the air. Hoses for cleaning are inserted into strategically located inlet



Vacuum equipment at each of the 240 individual assembly benches helps insure product reliability.

valves in the piping system conveniently located throughout the areas to be vacuumed.

## Benefits And Advantages

Insuring spotlessly clean work in final assembly and calibration, the Hoffman stationary vacuum system already has paid for itself. It has helped Summers Gyroscope reduce rejects, maintain high reliability, increase production and improve employee morale. The Hoffman system enables Summers to meet and exceed specifications in supplying inertial guidance systems, flight instruments and gyroscopes to the U. S. Air Force, U. S. Navy, the Martin Co., McDonnell Aircraft, Douglas Aircraft and the Convair Div. of General Dynamics, among others.

*If you have a special cleaning problem in your plant, ask for a free engineering survey to determine the most economical Hoffman system to prevent product contamination, salvage valuable materials, insure better housekeeping and encourage operating efficiency. Write for free booklet — How Stationary Vacuum Cleaning Systems Cut Costs, Increase Plant Efficiency.*

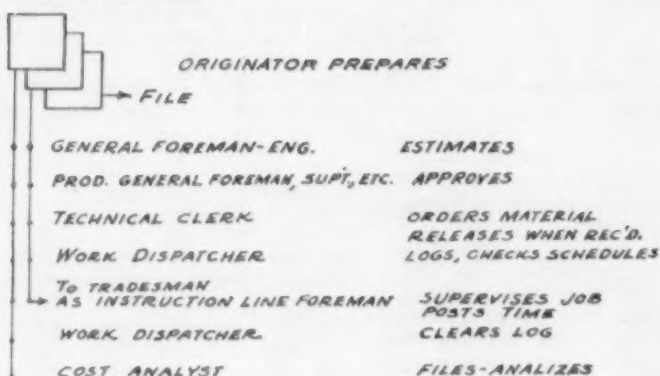
U. S. Hoffman Machinery Corp.  
Dept. S-4 Air Appliance Division  
103 Fourth Ave., New York 3, N. Y.

A final assembly area is kept dust-free by the Hoffman vacuum system.

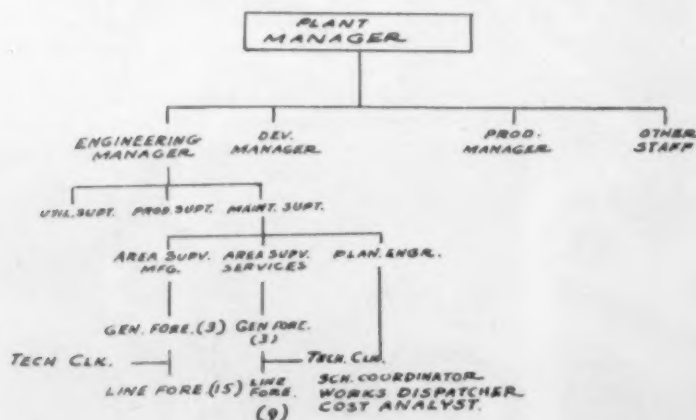
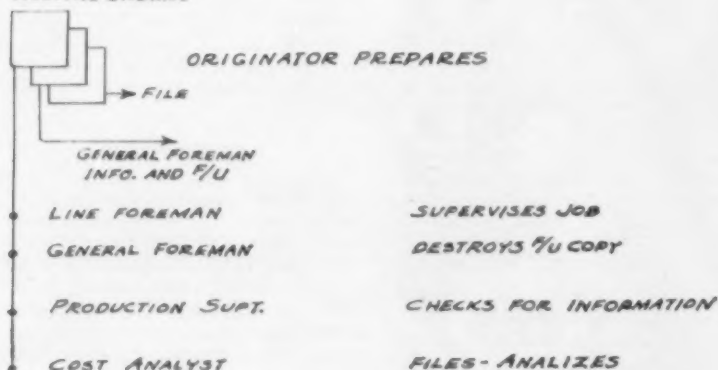


## Virginia Engineer Tells How 350 Maintenance Men Are Assigned Work . . .

### FLOW OF NON ROUTINE ORDERS



### FLOW OF ROUTINE ORDERS



# PLANNING and SCHEDULING

A FORMAL Planning and Scheduling System was inaugurated at the Celco Plant of the Celanese Corporation of America about a year ago. Considerable progress has been made, but we are quite aware that it takes time to work out the many problems concerned with design, institution and sale of such a program.

The Celco Plant is an acetate fiber manufacturing plant with end products which go into cigarette filters, the apparel industries, the plastic field, and others. The plant is a combination chemical and textile fiber and yarn operation, and employs approximately 1,700 people. Of these, about 350 are involved in maintenance and construction activities. The plant organization, both on a plant basis and for the Engineering Department, is shown on the attached diagrams.

### Objectives

To gain complete acceptance of the Celco system, the program was "sold" to those who would be dealing with it. The sales program, we believe, was the secret of success in attaining our objectives, which were:

1. Coordinated planning of personnel and material requirements on a long-term basis.



By  
**ROBERT H. LEGARD**  
Planning Engineer, Celco Plant  
Celanese Corporation of America  
Narrows, Virginia

2. Coordinated scheduling of all work for craft groups on projects.
3. Detailed planning of work on all projects.
4. Reduction of administrative work by personnel at all levels.
5. Examination of cost of work performance and comparison of this performance with engineering standards.

#### **Routine & Non-Routine**

The first step in scheduling was to separate personnel assignments into two groups — routine and non-routine. By routine, we meant those which normally did not change day by day, or week by week. Examples of such assignments were janitors, oiling and greasing, pump packing, shift work, machine overhaul, and similar routine repetitive operations. The non-routine group were those assignments in which personnel have constantly changing work. Most of the trades group fall into the non-routine group.

#### **Job Orders**

With our system, any supervisor in the plant may issue a job order, which is, in effect, a request for work to be done. This job order then goes to the engineering general foreman of the area concerned who makes an estimate of the

time to do the work and returns the job order to the level of supervision required for additional approval.

There is a fixed schedule for all levels of supervision indicating the extent in terms of man-hours that each level may approve. After approval has been gained, the job order goes to the technical clerk in the section. The clerk either requisitions materials from stores or issues the necessary purchase requisition.

After the materials have been received in the plant, the clerk releases the job order to the work dispatcher, who is in the Planning and Scheduling organization. The work dispatcher reviews each job order for correctness of charge, for completeness of instruction, and for a check on the estimate of time. He also numbers and logs the order.

The job order is then filled in one of three groups. These groups indicate the priority of the job. The originator assigns the priority when he prepares the order. Priority definitions are:

No. 1 — Maintenance or construction for safety, quality or production capacity requirements that has to be completed ahead of all other work.

No. 2 — Maintenance or construction which can be deferred on the schedule but which may affect product quality and/or operating capacity. This includes overhauls and scheduled maintenance, which, if deferred, may result in appreciable increase in maintenance costs and/or production down time.

No. 3 — Work which does not appreciably affect production. It is to be accomplished when crews are available in the work area.

#### **Scheduling**

On Wednesday and Thursday of each week, the line foreman in each of the shops has an assigned time to personally come to the schedule desk in the Planning and Scheduling section. At this time, all the job orders in Priority 1 group are pulled out and the work scheduler, together with the line foreman, makes the schedule of work for the non-routine group in that shop for the following

week.

It is important that all realize that the work scheduler does not make the schedules alone. He makes them together with the shop foreman. This particular point was one of the major points in gaining acceptance of our program by the line foreman.

After preparing the schedule of those jobs in No. 1 priority, remaining open spots in the schedule are filled first from the No. 2 and then the No. 3 priority groups.

It is our normal procedure that if a No. 1 priority cannot be taken care of during the coming week, the work coordinator goes back to the originator to determine whether he would like for us to work overtime on the job. If overtime is not authorized, we change the priority rating to No. 2.

After a schedule has been made for each of the individual shops, on Friday morning the schedule for each of the shops is duplicated and copies are sent to all supervision concerned within the plant. Attached to the foreman's copy of his non-routine schedule are all job orders covering the work scheduled for the coming week. It is intended that they should have this schedule by noon on Friday, or shortly thereafter. At the same time, he receives typed daily schedule sheets indicating name and rate and other pertinent pay data for the individual men under his supervision.

#### **Assignment of Tasks**

Each day the foreman makes a daily schedule from the schedules supplied him by the Planning and Scheduling group. This daily schedule shows a distribution of his entire force, both routine and non-routine. It should be recognized that the Planning and Scheduling group schedule people by number; that is, one tinsmith, two tinsmiths, or the like. The foreman is responsible for scheduling whether No. 1 on the schedule is Joe Smith or Jack Brown. It is definitely not the responsibility of Planning and Scheduling to assign individual persons to certain tasks.

At the completion of the day's work, the daily schedule is mark-

(Continued on Page 73)



**Gulf makes things run better, with—**

## **NEW GULFCROWN**

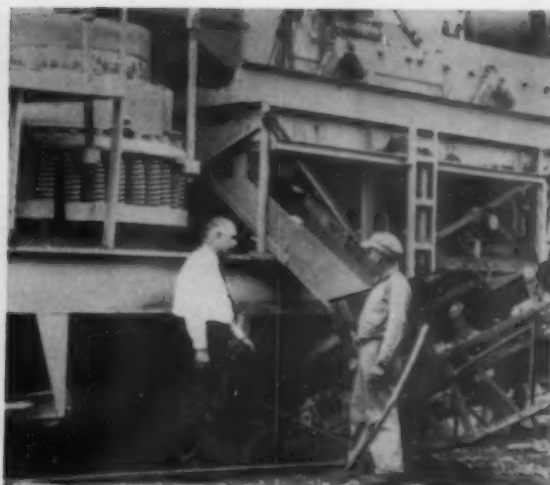
**Here's a multi-purpose lithium base grease for bearings in heavy duty service.**

It's a completely new bearing grease that effectively lubricates bearings operating under high loads, shock loads and with oscillating motion.

New Gulfcrown Grease E.P. will give you plenty of proof that Gulf makes things run better. It resists heat, cold, moisture and mechanical breakdown. It has excellent oxidation stability and protects against corrosion.

You'll find that this new grease pumps freely at 0°, yet stands up at temperatures to 250° F., and even higher under certain conditions.

New Gulfcrown E.P. is an unusually versatile multi-purpose grease. For example, it gives excellent results in the lubrication of heavily loaded trunnion bearings . . . steel mill work rolls and table rolls . . . sliding dog clutches . . . spiral gear boxes . . . Banbury mixers . . . the bearings, cams and gears in textile looms . . . and



▲ In hard-working equipment, like stone crushers, new Gulf-crown Grease E.P. withstands extremely high shock loads in grease lubricated bearings.



▲ In textile mills the excellent residual anti-weld properties of new Gulfcrown Grease E.P. makes it the ideal lubricant for loom bearings, cams, pick balls and gears.

◀ In steel mills, new Gulfcrown Grease E.P. will successfully withstand the high temperatures and extreme pressures encountered in the lubrication of work rolls and table rolls.

# GREASE E.P.

a host of other heavy-duty industrial applications. Gulfcrown E.P. can be used for electric motor bearings, fans, pumps and for nearly every type of application. Can be applied through centralized systems or by gun. Available in NLGI consistencies 0, 1 and 2.

Find out how Gulfcrown E.P. can improve your operation and help you get lower maintenance costs. Call your Gulf Sales Representative at the nearest Gulf office. Meanwhile, mail coupon for new booklet.

## GULF OIL CORPORATION

Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Please send booklet on new Gulfcrown Grease E.P.

Name

Title

Company

Address

City  Zone  State



SPI-5208



## **Dixie Bearings, Inc. service...this catalogue ...these plant men add up to big savings in bearing purchases!**

Our Bearing Engineer was given permission by his customer to survey and compile a list of all equipment in their new plant. The proper bearings for each piece of this equipment were then catalogued. Shown above is the plant engineer, plant superintendent, and our sales engineer going over the results of his work. This catalogue shows application data on all machinery in the plant and lists the total number of bearings in the plant by size and bearing manufacturers' numbers.

It's now the "Bible" of the plant for bearing purchases and savings, since its completion, have been impressive!

Maintenance men now know the exact replacement bearing to requisition from stock. All bearings are correctly identified and are now ordered with the proper bearing numbers. Stocking several identical bearings for different machinery applications is *eliminated*.

We can perform this and many other services for you... For if it's a bearing problem, a call to our nearest branch will get you the answer!

### **DIXIE BEARINGS, INC.**

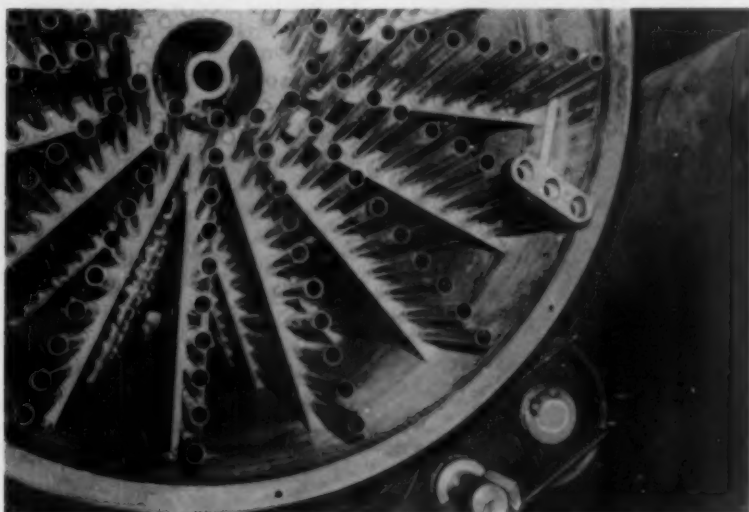
*Providing bearing service  
in the South*

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**S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville



# BYERS GUIDE

Maintenance and Operating Tips from A. M. Byers Company



Lafuette crystallizers, like the one pictured above in a sugar refinery, use cold drawn 4-D Wrought Iron tubing. 4-D Wrought Iron heat exchanger and condenser tubing is virtually unaffected by refrigerating gases such as ammonia, carbon dioxide and Freon. Highly resistant to both corrosion and abrasion, 4-D lasts longer than many higher priced ferrous and non-ferrous metals in salt water, heat transfer brines, and industrial cooling waters.

## Industrial Plants Report a Tubing Material More Durable Than Expensive Alloys

Industrial maintenance records indicate cold drawn Wrought Iron tubing displays more durability than expensive alloys and non-ferrous materials. Invariably, 4-D gives longer tubing service life than carbon steel.

Here are two reports on typical industrial applications:

- A double-tube ammonia condenser in an ice plant had steel tubes. The cooling water used in this condenser contains 76 ppm of sodium chloride. The steel tubes failed after 2 years and were replaced by Wrought Iron tubes which are still in excellent condition after 18 years.
- Vaporizers for butane and propane gas production handle petroleum under pressure at ambient temperatures (10°F. min.). Petroleum is vaporized by passing steam at 10 psi and 265°F. through tubes inserted in the jacket. The unit operates continuously. In this application mild steel tubes were destroyed in 3 to 6 months and stainless

steel tubes in 6 to 9 months. Wrought Iron tubes are serviceable for at least two years.

We have a technical report which covers briefly, but informatively, 15 similar heat transfer equipment installations. Actual names and places of the installations appear in this report. Comparative cost-per-foot-per-year figures have been calculated for Wrought Iron and steel. A copy of this convincing study will be sent to you upon request.

## In Sulfuric Acid PVC Bests Stainless at 1/5 the Cost

Stainless steel pipe often fails where Byers Polyvinyl Chloride Pipe doesn't. Take sulfuric acid applications. Here, Byers PVC Pipe not only out-performs stainless in terms of corrosion-resistance, but costs less on an installed cost basis: only one-fifth the cost of stainless.

In a wide range of other corrosive applications where metal pipe is either unsatisfactory or quite costly, Byers PVC provides constant, un-

## Stack Service Life: Ripe Old Age or Early Demise?

The material you select for stack applications can make the difference of a lifetime. 4-D Wrought Iron resists acidic flue gas corrosion much more successfully than ordinary steel. Moreover, the protection of a 4-D Wrought Iron stack costs much less than a masonry stack.

4-D Wrought Iron in stack service gives no evidence of the rapid deterioration so characteristic of conventional materials. Although costing somewhat more than steel, 4-D often lasts more than twice as long. This saves the cost of at least one re-fabrication and re-installation, as well as accompanying interruptions and downtime. When building new stacks or replacing old ones, consider the long service life of 4-D Wrought Iron.



4-D Wrought Iron plate lengthens stack life, reduces maintenance costs at new Owens-Illinois Glass Company plant in Atlanta, Ga.

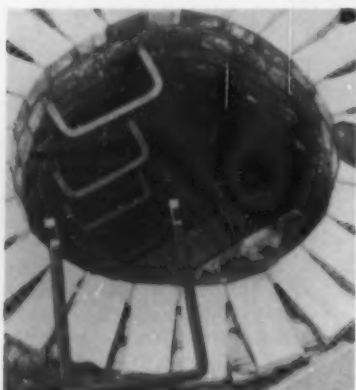
interrupted service. In acid fume vent piping, acid reactor blowoff lines, drain and sewer lines, and process lines handling acids, alkalies, oxidizing agents, alcohols, brines, plating solutions, slurries and the like. Where product purity is important, Byers PVC Pipe is especially suitable. It won't contaminate. We have a raft of performance data on our PVC. Write us about your specific application or problem.



# BYERS GUIDE

Maintenance and Operating Tips from A. M. Byers Company

page 2



Wrought Iron rungs are shown here set in masonry in the 85-foot Main Avenue water tunnel shaft in Cleveland, after serving 55 years. Because of uneven spacing, the old rungs were burnt off and replaced with new ones of 4-D Wrought Iron.

## How Safe Are Your Manhole Ladder Steps?

To provide workmen with safe, secure footing on manhole ladders, it is imperative that the steps be corrosion-resistant. Damp, humid atmospheres found in tunnels are death to ladder steps made of ordinary metals. Ordinary metals don't stand the test of time and wear as well—or as economically—as 4-D Wrought Iron. 4-D is durable. Safe. Practical. Needs no protective coatings. A firmly anchored protective scale, developed by the material itself, acts as a shield against further corrosive attack. No other metal has this unique capability.

Many plants have developed a standard design for 4-D Wrought Iron ladder steps and stock them in quantities at the warehouse. Play it safe. Use 4-D Wrought Iron for fabricating your new ladder steps—or for replacing old ones.

## U. L. Approval for 4-D Wrought Iron Conduit

Certification of 4-D Wrought Iron electrical conduit by Underwriters' Laboratories, Inc. offers plant people another new weapon for battling corrosion. The labeled conduit is especially suitable for highly corrosive plant applications where attack by aggressive elements causes excessive maintenance or replacement of ordinary conduit materials.

Wrought Iron has been used for over 50 years in corrosive electrical conduit installations not requiring U. L. certification. Now, with the U. L. label, 4-D Wrought Iron can be used for any conduit application. There's no internal flaking or clogging with this conduit. Its resistance to vibration and fatigue stress is excellent. Fabrication is a cinch. And it's sherardized and coated with MVC-1 vinyl. This guarantees easy fishing.

Through an agreement between A. M. Byers Company and National Electric Products Company, U. L.-labeled 4-D Wrought Iron conduit is marketed through National's 11 warehouses, 29 district offices and authorized distributors throughout the United States.

## A Welding Tip Or Two

Each of 4-D Wrought Iron's two components—high purity iron base metal and glasslike iron silicate—has its own fusion temperature. The siliceous material melts first (2100°-2200°F.), several hundred degrees before the iron (2730°F.). But don't confuse the fluxing of the iron silicate with melting of the actual base metal. Just continue heating until the iron fuses. 4-D's self-fluxing action contributes to sound, durable welds.

## WHAT IS "4-D"?

*Wrought Iron* is a two-component metal—high purity iron impregnated with non-rusting iron silicate fibers. *New 4-D Wrought Iron* was achieved by substantially increasing the deoxidation of the base metal, slightly increasing the phosphorous content, and using a more siliceous iron silicate. Result is increased corrosion resistance, improved mechanical and physical properties.

## Literature Available

Literature described below is available on request. For information on specific applications, write Byers Engineering Service Department.

New four-color booklet, **4-D Wrought Iron: A New Dimension in Corrosion Control**, discusses in detail Byers' latest product development. Includes a test section which is graphically illustrated and shows comparative corrosion resistance of 4-D Wrought Iron, standard wrought iron and other ferrous metals.

New ten-page bulletin, **Cold Drawn Wrought Iron Heat Exchanger and Condenser Tubes**, cites actual installations in which the use of 4-D Wrought Iron and other metal tubing in the same equipment permits service life comparisons. Lists cost-per-foot-per-year for each material and the corrosive conditions present.

In the most technically complete PVC catalog yet prepared, we discuss our latest piping material—rigid unplasticized polyvinyl chloride pipe—its characteristics, applications, properties and installation practices. The **Byers PVC Pipe Catalog**.

For additional information on 4-D Wrought Iron, contact Byers Division Offices in the cities listed below.

The maintenance and operating items appearing in BYERS GUIDE were prepared by the Engineering Service Department of

## A. M. BYERS COMPANY

Pittsburgh 22, Pennsylvania

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA  
PITTSBURGH • ST. LOUIS • SAN FRANCISCO • WASHINGTON, D. C.

4-D Wrought Iron is immediately available and may be obtained through established distributors of Wrought Iron Pipe. Plate, bar, and other flat rolled products may be ordered direct.

**Corrosion costs you more than Wrought Iron**

## Planning and Scheduling

(Continued from Page 67)

ed to indicate whether the assigned work was done or not, and, if not, what other work was done in its place. The following morning, this sheet is forwarded to the scheduling coordinator, who passes it on to the paymaster for payroll purposes. This is the only time sheet submitted on the trades people.

### Follow-Up

On each Friday afternoon, after schedules have been completed, the Planning and Scheduling group prepares a priority review for general distribution, listing all jobs not scheduled for the following week by area, job number, and craft. From this review, the Scheduling people know which areas can expect a shortage of personnel and where work schedules may be held up.

Copies of the review are forwarded to the request originators to advise them of the action taken on their jobs. It is expected that a few calls will be received each week from originators demanding a change in schedule as a result of their work not being scheduled.

Over and above the weekly priority review, a monthly tabulation is made of all work by shops to determine backlogs and availability of man power.

### Construction Work

Construction project work, which at present is amounting to some 15% of the Celco labor force, is handled in identical manner to that of maintenance work. Development work is handled likewise.

Work to be performed by the routine crews will be handled in a slightly different manner. In this case, job orders are to be prepared in three copies with the original going directly to the area foreman. The carbon is then sent to the manufacturing area engineering general foreman, while the originator holds the third copy. On completion of the work, the area foreman will give his completed job order to the area general fore-

man, who passes it on to the production superintendent.

From this point, the completed job order is forwarded to Planning and Scheduling for filing. This file indicates the activities of persons assigned to routine repetitive work. As with all phases of introducing a Planning and Scheduling System, this deviation from the normal procedure for handling routine work is given a thorough try-out in one of the departments before being introduced on a plant-wide basis.

With the non-routine work, the job order has posted to it the time spent on the job covered by this job order. That job order is forwarded to Planning and Scheduling on completion of the job where the log is cleared. After this, the job order goes to the cost analyst who uses these job orders in budget preparation and cost analysis.

### Planning Coordinator

Each day the planning coordinator tours the plant, checking both jobs and engineering supervision. He has an assigned time to visit each of the area general foremen. If Production or Development personnel in the area have work that they would like to get into the system on an urgent basis, they meet the planning coordinator at these times. He knows the disposition of all plant forces and in this manner can tell people whether or not their jobs can be handled without serious interruption to others.

In the planning of projects, immediately after approval of such projects, the planning engineer meets with all persons involved on the job to determine the extent of the job and manner of procedure. These meetings are repeated as necessary to keep up with progress and with changes.

### Written Schedule

As soon as practicable, a written schedule is prepared showing disposition of crews on a weekly basis. The work dispatcher trans-

fers these project schedules on a long-term planning data sheet. This sheet indicates the week of the year and provides spaces for insertion of hours scheduled on the various projects by shops. In no case are more hours scheduled on this sheet than are available in the non-routine crew for that shop.

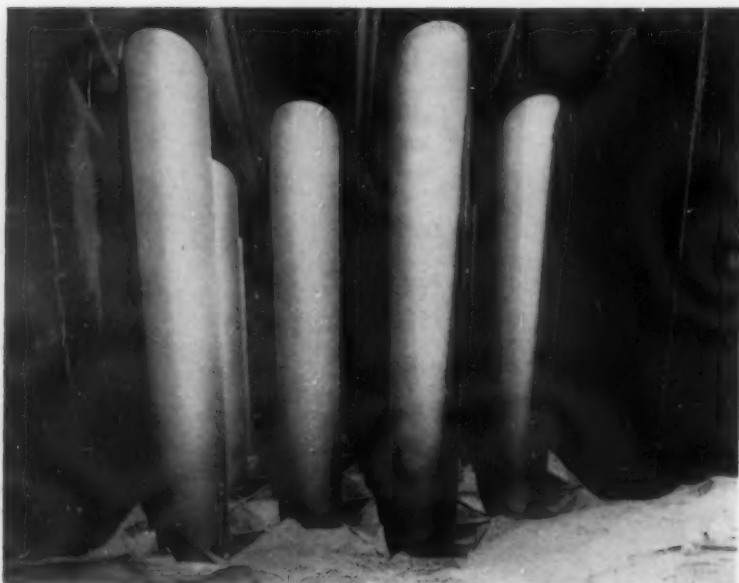
This sheet, of course, is constantly being revised due to changes in project priorities. It is from these that we are able to advise when projects are expected to be completed. The daily contact that the planning coordinator has with the jobs is used to roll back or push forward the dates of work in the coming weeks.

### Key Points of System

In summary, we believe the key points to our Planning and Scheduling System are:

1. We were fortunate to have an engineering manager who had more than thirty years' experience in scheduling, and it was he who gave the impetus to the program by holding discussion seminars from which the choice of systems could be made suitable to the local circumstances.
2. The aim of the system is:
  - a. to reduce the administrative work of the supervisory staff in order to devote more time to engineering;
  - b. to bring all important administration into one trained group such as the Scheduling Department;
  - c. to make all personnel think ahead and be conscious of planning;
  - d. to distribute available plant man power logically and economically; and
  - e. not to involve the hourly people as such, directly, but to make them feel that they get better technical instructions and their abilities are used at proper time and proper place.
3. The program was outlined to the plant management in order to receive their support. The introduction was done with each department on a trial basis, taking into consideration the comments of the maintenance people and their customers, before finalizing.





One of two Hagan Aerostatic Dust Collectors is opened for inspection after experiencing the equivalent of 20 years' wear in less than 14 months at the Rivesville (West Virginia) station of the Monongahela Power Company.

## Secondary Collectors Cut Maintenance

**INSTALLED** at the Rivesville (West Virginia) station of Monongahela Power Company, two 18-tube Aerostat dust collectors are used as secondary units on a pulverized coal fired boiler. Primary units expel cleaned gas, while concentrating the fly ash into approximately 5% of the total gas volume and passing this load to the small Hagan collectors. In this manner a dust loading of approximately 40 gn/cu/ft is handled by the Hagan Aerostat collectors — about 20 times the usual fly ash loading from a wet bottom boiler.

Monongahela Power Company utilizes this primary-secondary collection system because of space limitations. The small collectors are located close to the primary units, connected by insulated ducting.

More than 10 tons are collected daily by each unit. This means more than 2500 tons of dust are collected and disposed of annually.

During a scheduled outage, plant personnel recently opened one of the Hagan collectors to see how the unit was holding up under this punishing load. They found no serious wear at the inlet vanes, the dust discharge ports, or at any other part of the collector.

This insignificant wear surprised plant officials since cyclone collectors installed previously — and handling the same heavy dust loading — had required maintenance about every year. To date, the Aerostat collectors have required no maintenance, and none is expected for several years.

Lack of wear is attributed to a unique venturi-spiral van design which produces an even flow distribution over the entire inlet nozzle area, thus eliminating critical areas of wear. In addition, each hexagonal inlet nozzle is welded to others on all six sides, eliminating flat waste areas which encourage dust deposits and eventually lead to plugged tubes.

## Faster Sprocket Replacement

**RECENT** further development of the idea of split sprockets mounted on separate, detachable hubs such as have been used with considerable success in the roller chain field, for many years has resulted in a new sprocket, for conveyors and elevators, known as a segmental sprocket.

On one rather large inclined conveyor in a Georgia plant, Chain Belt segmental sprockets were employed to replace a conventional type on the head end. A check revealed that replacing the sprocket required four maintenance men, a crane, the crane operator and his helper. Time consumed was 4½ hours for these six men and the crane.

When the teeth in the segmental sprocket became worn, two men reversed the segments in 2½ hours without the crane or any other equipment, other than their usual hand tools.

After only this much experience, when time came to replace the segments with a new set, one man was able to do the job in about one hour.

The short, easily handled, segments can be removed, and replaced, without disconnecting the chain. They are machined on both sides for easy reversal, to give double life.

By **R. L. FULGHUM**  
Atlanta, Georgia

## Material Handling

**THE EDITORS** are gathering material for SPI's Fourth Annual Special Section on this subject.

Engineers in the South and Southwest are invited to send articles showing actual saving in their plants through use of more, or improved, material handling equipment.

Payment will be made for acceptable articles and the editors will help put material in form for publication.

Tell about the old condition, what improvements were made, and be sure to tell about results.

Write: The Editors





## from Westinghouse...the only complete maintenance inspection and engineering service on a scheduled basis!

**Weekly, monthly or yearly—whatever your needs—this Westinghouse engineer will check and test your electrical equipment under contract**

You can now have an experienced Westinghouse Maintenance Engineer—with a fully equipped service truck—in your plant, working for you. Behind him he has the complete resources, research, engineering, man power and facilities of Westinghouse. Yet your cost is less than the relative cost of lubricating your car—less than 1 percent of the value of your equipment.

These scheduled inspection recommendations and adjustments can prevent equipment failure, reduce outage and downtime to a minimum. Maintenance Engineering Service, on a yearly contract basis, is designed to inspect and test all your electrical equipment.

*\*Offered in Westinghouse Southeastern Region Only*

For complete information, send this coupon to Westinghouse Electric Corporation, 1299 Northside Drive, N.W., P. O. Box 4808, Atlanta 2, Georgia. What electrical equipment do you have? J-95178-R

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| <input type="checkbox"/> generators   | <input type="checkbox"/> control systems                            |
| <input type="checkbox"/> transformers | <input type="checkbox"/> substations                                |
| <input type="checkbox"/> switchgear   | <input type="checkbox"/> primary and secondary distribution systems |

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**YOU CAN BE SURE...IF IT'S**

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# How to Use Castable Refractories

**MAINTENANCE** engineers are not using castable refractories for many applications where it is a "natural." This hesitancy to use this versatile material can be attributed to two reasons: (1) lack of knowledge of its advantages and (2) previous results were disappointing.

Some advantages of using castable are:

1. It is as easy to use as structural concrete, just pour into place.
2. It eliminates need for expensive kiln-fired special shapes, saving money, avoiding delays, and reducing inventories.
3. It can provide inexpensive protection to non-refractory furnace parts.

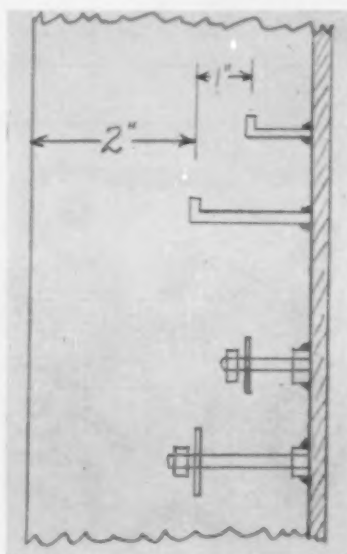
Many people have tried castable type refractories and the results were disappointing, since the refractory cracked and spalled in service. However, they will give very satisfactory service if the proper material is selected and a few basic rules are followed in the installation.

**How to Mix:** Castable refractory is usually packed dry in 100 lb bags and must be mixed with water before using. The manufacturer's mixing instructions on the bag or attached tag should be followed. The refractory can be mixed to three degrees of consistency; pouring, tamping, and ramming.

Pouring consistency has enough water in the mixture to cause the material to flow and level out. Tamping consistency has just enough water added to permit the material to be puddled into place with rods or sticks. Ramming consistency is dry with just enough water for the mixture to hold together when packed solid. This ramming mixture should be used with caution as the amount of water may not be enough to set all of the hydraulic cement; and as a consequence, the finished refractory may lack strength.

**How to Support:** Many installations of castable refractories have failed due to expansion and con-

traction between the refractory and supporting structure. These failures can be reduced by coating the supports or bolts with paraffin or an asphalt mastic. The coating will melt or run out when heat is applied and will allow a small amount of movement which will take care of the expansion in many cases.



In the installation of anchor bolts, the bolt should be at least 2" from the surface. If the castable is a lining type and it is necessary to install bolts closer to the surface, an alloy bolt should be used to resist the high temperature. The length of the bolts should be varied because this will tend to eliminate a cleavage plane in the refractory.

Where peep holes are needed, wooden plugs of the proper size can be installed before pouring the refractory. The wooden plugs should be soaked overnight to prevent water absorption from the refractory. This soaking ahead of time will facilitate the removal of the plugs and eliminate the swelling which could weaken the refractory. The refractory should be poured as soon as it is mixed, do not allow it to set, then add

water to partially set material. This will cause the refractory to be structurally weak.

After the castable refractory is poured and puddled to eliminate voids, the forms should not be removed for 24 hours. The strength of castable refractory will increase with prolonged air drying. It should not be subjected to heat for at least forty-eight hours to allow drying and setting. However, if needed sooner  $\frac{1}{4}$ " diameter holes on 6 to 12 inch centers can be punched into the material with a rod before the material is fully set. This will facilitate drying.

By L. J. CORMACK  
Metairie, Louisiana

## Maintenance Hints Handbook

**A NEW 24-CHAPTER.** 650-page edition of Maintenance Hints handbook has been published by Westinghouse Electric Corporation.

The 5 x 7-inch leatherette-bound manual is designed to provide a quick, complete and convenient guide to modern maintenance practices on all types of electrical equipment.

The handbook is divided into two sections. The first 17 chapters cover specific apparatus maintenance; the last seven cover general maintenance of materials used in apparatus, such as insulation.

All chapters in the revised manual have been extensively updated and revised. In particular, the new edition contains a chapter on maintenance of static controls — the first information ever published in a general handbook. The chapters on electronics and electric brakes have been considerably altered and enlarged.

Throughout the manual, every effort has been made to provide complete information while keeping it general in nature to apply to all types and makes of electrical equipment.

For a copy of Maintenance Hints, send a \$2.00 check or money order to Westinghouse Electric Corporation, P. O. Box 2099, Pittsburgh 30, Pa.

UNI-STOKERS NEVER DIE, NEVER DIE  
THEY JUST GO ON... AND ON\*

**31 Year old Detroit UniStoker is still  
serving and saving**



Boiler Room—  
The Lodge & Shipley Co.  
Cincinnati, Ohio, 31 year  
old UniStoker at right. New  
UniStoker at left.

● A Detroit UniStoker installed at The Lodge & Shipley Co., Cincinnati in 1927 performed so well and proved the economy of UniStoker firing so conclusively that another UniStoker was purchased in 1958 when added steam capacity was needed to serve plant expansion.

EVEN MORE SIGNIFICANT—the original UniStoker after 31 years of service was doing such a good job it was deemed worthy of modernization.

Some of the up-to-date UniStoker features were added to it and many more years of efficient operation are expected.

As the song says—"They just go on and on", saving as they go.

YOU can save with Detroit Stokers. Let one of our sales Engineers recommend the correct stoker for your needs.

The Complete Detroit Line of Underfeed and Overthrow Spreader Stokers provides a type and size for almost any boiler from 3,000 to 400,000 pounds of steam per hour capacity.

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# Control of

# Non-Routine Maintenance

By **F. C. CLAYTON**  
Chief Plant Engineer  
Convair-Fort Worth

A MAINTENANCE Department or section, as in our case, of the Plant Engineering Department has many duties besides actual maintenance. These include construction, installations, rearrangements

and manufacture of perishable equipment and production aids. It is not economical to man to the total requirements of all types of work, but rather to use an integrated work force on a carefully

scheduled basis.

One particular precaution must be to protect the integrity of the preventive and routine maintenance programs while performing these other tasks, sporadic in na-

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ture, with minimum added manpower. With this in view, a work control and scheduling section has been set up in the Plant Engineering Department to issue current schedule information on all work not of a strictly maintenance nature.

Schedules give breakdown by trades of man-hours required in both design and shop. These are so coded that they can be put on the tab cards and run off through the tabulating system. With no additional labor, tabulations are run weekly, with items arranged by both category and PEO (Plant Engineering Work Order) sequence. The first digit of PEO

numbers indicates financial classification. "Category" is coded as follows:

- "T" — In work
- "M" — Mandatory
- "S" — Started and stopped
- "N" — Not started
- "U" — Unable to work
- "R" — Open request PEO's

Separate tabulations are run for jobs in design (Dept. 25-2) and in maintenance - construction shop (Dept. 25-3). Man-hour estimates by trades are made by design engineers. Figures shown on 25-2 tabulations are preliminary. Those on 25-3 tabulations are firm esti-

mates. The figure shows a typical 25-3 sheet, with an explanation of the columns superimposed above it.

From these tab runs, maintenance supervision can quickly determine manpower needs in each labor class by weeks. A forecast is also made by months and quarters of all major work known to be coming up. This gives a guide for making commitments as well as for manning the department. It also makes possible the scheduling of major maintenance, particularly on buildings and utilities, to take advantage of lulls in non-maintenance tasks utilizing the same trades and vice versa.

## New Motor Cuts Maintenance

**MANY MOTOR** users throughout the South and elsewhere have cut their motor maintenance and replacement costs with a new type of specially protected drip-proof motor. They have found that these new motors stand up better than totally enclosed motors on a wide range of applications from the severe acid and caustic atmosphere of Florida juice plants to the abrasive dust of cement plants.

At the Southern Fruit Distributors, Inc. plant in Orlando, Florida, these motors are continually exposed to citrus juice and oil skin acid in the moist atmosphere where they operate. To counteract this condition, equipment is daily cleaned with a strong caustic solution. The caustic solution alone is sufficient to destroy conventional windings. The new type motor, which protects the windings from the action of the acid and caustic atmospheres yet lets condensation drain out the open bottom of the motor, has proved entirely satisfactory on the application.

In Savannah, Georgia, Cements Products Company uses the new type motor on applications where abrasive dust previously necessitated the use of totally enclosed motors.

Meco, Inc. in Savannah, uses the motors on air compressors that operate out-of-doors and are exposed to all kinds of atmospheric

conditions. A Florida concern used one in a continual steam-bath atop a portable asphalt mixer.

The motor is a new drip-proof induction type, manufactured by The Lincoln Electric Company. The special protection is called "Multiguard," which is a thermosetting resin type of plastic similar to that used in plastic automobile bodies, shipboard tanks, small pump housings and similar

parts that are subject to corrosive wear. During manufacture, the plastic is forced through the motor windings to surround each individual wire and bond them all into one impenetrable mass. It also completely encapsulates the coil noses to prevent acids, salts, alkalis, abrasive dust and similar contaminants from attacking the windings and causing motor failures.

By **HOWARD DYE**, District Engineer, The Lincoln Electric Company, Atlanta, Georgia.

New type open motor withstands the highly abrasive dust created by a rock crusher in a St. Louis quarry.





# NEW Product Briefs

Tools and Supplies for **BETTER MAINTENANCE**

## High Voltage A-C Test Sets

F-1

General Electric has announced immediate availability from stock of its new line of high voltage a-c test sets used for applying dielectric tests to all types of electrical apparatus.

Self-contained in an upright all-steel cabinet, the test sets are available in four standard ratings, 20,000 to 50,000 volts and 2 kva (one hour). An easily operated control panel is located at arm height on a sloping front area at the top of each unit.

The new a-c devices use an oil-filled, corona-free transformer, a safety contactor in addition to a magnetic circuit breaker, and are push-button operated.

Although basically designed for stationary equipment, the high voltage sets can be converted easily for use as mobile units. Convenient, safe dielectric testing can be made by the units of basic insulating materials, motor and small transformer insulations, circuit breakers, electric panels, linemen's gloves and other apparatus up to 50 kv.

## Dry Acid Cleaner

F-2

A dry acid cleaner, based on Sulfamic Acid, cleans industrial equipment more easily and more safely than hydrochloric acid. The cleaner, manufactured by **Leo, Revere & Van Buren Chemical Co.**, 432-8 W. 70th Terrace, Kansas City 13, Mo., gives off no fumes and is not as corrosive as hydrochloric acid but is every bit as penetrating and effective.

Super-Sulfamic is ideal for removing scale and deposits from such equipment as steam boilers, pasteurizers and milk evaporators, heat exchangers, air conditioning and ice-making equipment, various food processing vessels.

## Fastener Tool

F-3

A new, hand operated tool for setting nail-type pins and threaded studs into masonry, concrete and concrete block has been announced by **Star Expansion Industries Corporation**, Mountainville, New York.

This ingenious tool, marketed under the tradename of Hamdriver, holds fasteners true and straight, keeps them from buckling or bending as they are driven home with an ordinary machinist's hammer — without drilling holes.



The tool is simple in design — requiring no special attachments — and was developed especially for craftsmen and maintenance men for making direct fastenings to concrete, masonry and concrete block.

Fixtures are permanently, uniformly secured with threaded Hamrstuds or nail-type Hamrpins. Both are especially heat-treated to produce the best combination of hardness and toughness. Studs and pins provide outstanding holding power in good quality concrete, and are so strong they will penetrate up to ¼-inch thickness of low carbon steel.



## Electric Drill

F-4

A ¾" electric drill has been introduced by the **Porter - Cable Machine Company**, 113 Exchange St., Syracuse, New York. The Model 149 drill, with added power and larger chuck capacity not available in standard ¾" drills, will handle the tougher drilling jobs in wood or metal.

For More Free Data **FILL IN CODE NO.** on the Handy Return Card — Page 89

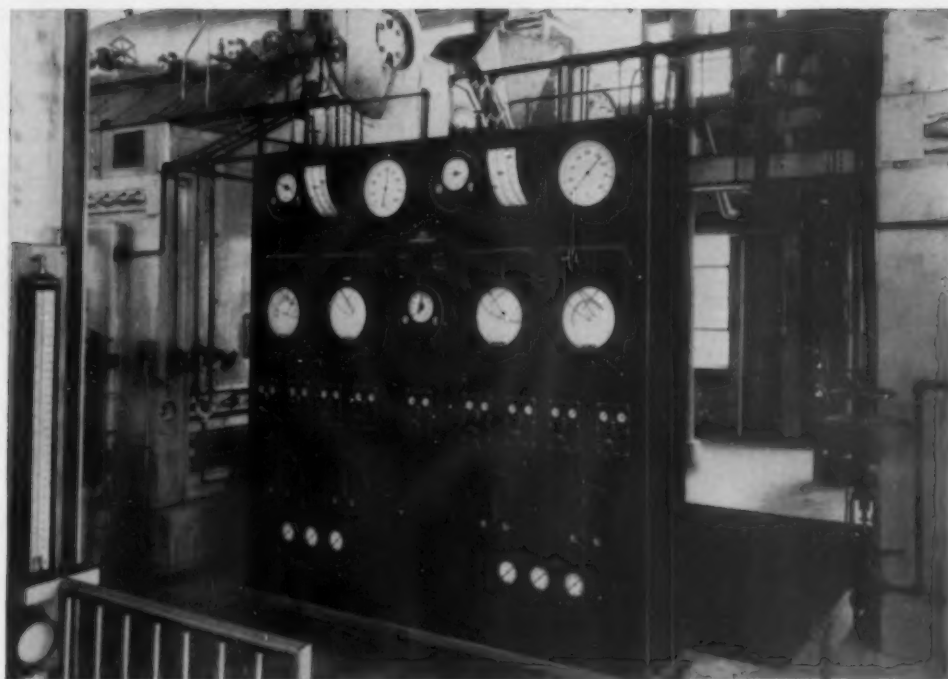
## Stud Driver

F-5

Reduced inventory and improved operating efficiency when setting studs with the "Green Hornet" Velocity-Power Stud Driver are twin benefits of the new two-piece stud and cartridge assemblies now being marketed by the **Velocity Power Tool Company**, 201 N. Braddock Ave., Pittsburgh 8, Pa.

Adaptability of the new assemblies' six varied cartridge loads to all styles of the ¼-inch and ⅝-inch stud sizes, permits the operator to carry a box each of separate studs and cartridge loads within his driver's case.

Interchangeability of each cartridge load with all stud styles in each size bracket, permits the operator to make on-the-spot adjustments of cartridge load requirements. If the original load proves too heavy or too light for a particular steel or concrete surface, the charge can be increased or decreased by changing to the appropriate cartridge load.



Bailey Meters and Controls for two boilers in a midwestern milling company.

## How Bailey helps you get a new boiler off to a fast, safe start —

-- The thrill of putting a new boiler "on-the-line" can be marred if you lack adequate metering and control equipment. You are a lot surer of a fast, safe start and dependable operation for a long time when you specify Bailey Meters and Controls. They are keys to peak efficiency and low operating costs.

Bailey is the choice of virtually all the most efficient plants on the Federal Power Commission's heat rate report. Here's why:

### 1. A Complete Line of Equipment

You can be sure a Bailey Engineer will offer the right combination of equipment to fit your needs. Bailey manufactures a complete line of standard, compatible pneumatic and electric metering and control equipment that has proved itself. Thousands of successful installations

involving problems in measurement, combustion, and automatic control are your assurance of the best possible system.

### 2. Experience

Bailey Engineers have been making steam plants work more efficiently for more than forty years. Veteran engineer and young engineer alike, the men who represent Bailey, are storehouses of knowledge on measurement and control. They are up-to-the-minute on the latest developments that can be applied to your problem.

### 3. Sales and Service Convenient to You

There's a Bailey District Office or Resident Engineer close to you. Check your phone book for expert engineering counsel on your steam plant control problems.

A131-1



*Instruments and controls for power and process*

## BAILEY METER COMPANY

1028 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada — Bailey Meter Company Limited, Montreal

## New Maintenance Product Briefs (Continued)



### Lever Hoist

**F-6** **Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore, Inc., Muskegon, Michigan** has expanded its 'Tugit' line of tool-box size lever operated hoists to include  $\frac{1}{4}$ ,  $1\frac{1}{2}$  and 3 ton models to complement present popular 1 and 2 ton models and provide a size for every need, thru 3 tons, for any kind of pulling, stretching or lifting job.

'Tugit' hoists are built with gearing and load brake instead of the usual long ratchet lever and pawl. They can be operated in extremely close quarters and permit accurate load spotting.

Construction features include: compact design with gearing and load brake totally enclosed in an aluminum alloy frame; non-fracturing upper and lower hooks that are full-swiveling; link type alloy steel load chain, designed especially for hoisting service; and a built-in free-wheeling device for quick positioning of lower hook.

### Spray Gun Maintenance

**F-7** An improvement in the care of spray guns known as Protexem, is manufactured by **Wisconsin Laboratories Inc., Dousman, Wis.**

Two conditioners are being offered — the shop type which holds two complete guns with jars attached and the junior Protexem (Minia-

ture conditioner), which fits over the nozzle of the spray gun.

The larger Protexem is for guns that are to be stored for longer periods of time, the junior Protexem is slipped over the nozzle of the spray gun when there is a delay or an interruption. It takes only a few seconds to slip the conditioner over the nozzle to obtain protection for overnight or over the weekend. The vapor solvent keeps the spray material dissolved and the gun does not clog.

A recent improvement in the formulation of the vapor solvent has resulted in increased fire safety, reduced toxicity and greater solvent potency. The flash point of the vapor solvent is 70 F. Evaporation rate and vapor pressure of Protexem vapor solvent is moderate. Since vapors have many times the solvent potency of liquids, the manufacturers of Protexem achieve high solvent power with solvents that are relatively safe.



### Corrosion Resistant Aluminum Insulation

**F-8** Developed by **Preformed Metal Products Co., Inc., 201 Airport Dr., Shreveport, La.**, new colored Copon Premetco Aluminels can be used for installations where corrosive fumes and sprays would damage untreated aluminum covering.

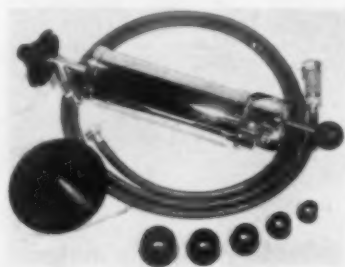
Exterior and interior surfaces are treated by spraying and baking on colored Copon, an epoxy resin. Matching jacketing with corrosion resistant Copon finish is available

for use with the colored Copon Aluminels. Both jacketing and Aluminels are black colored.

Tests conducted subjecting Copon from 10 to 400 F showed no embrittlement or softening of film. After 1,000 hours in both salt spray cabinet and weatherometer, Copon showed no film breakdown.

Premetco Aluminels have a 2" overlap beyond the turned section to assure a positive closure with straight sections of jacketing. Installation is made with metal holding screws. Only an ice pick is required to punch screw holes.

For More Free Data FILL IN CODE NO. on the Handy Return Card — Page 89



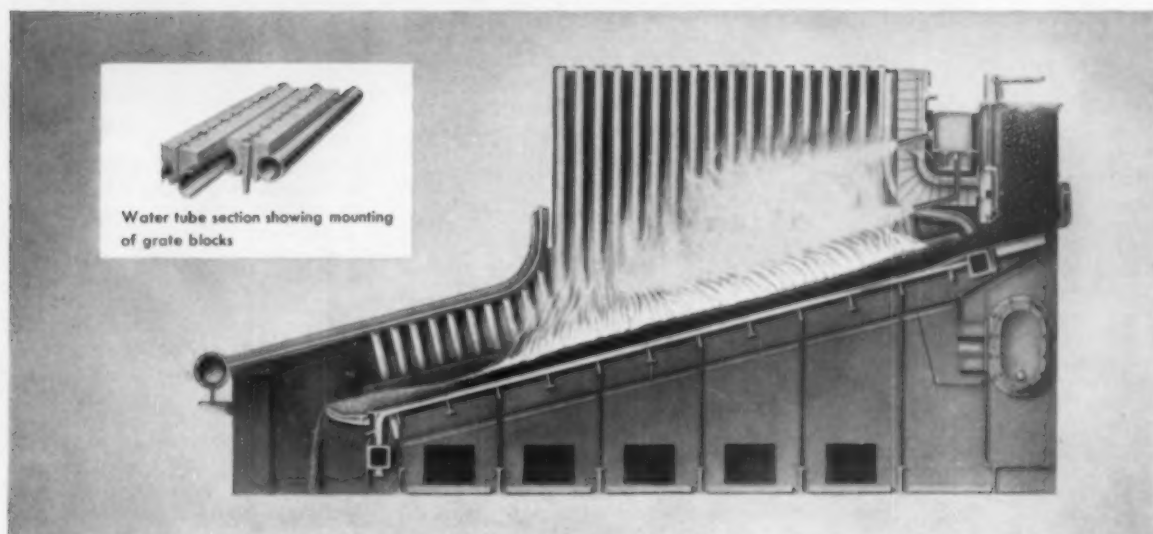
### Hydraulic Water Ram

**F-9** A special oversize molded rubber cone,  $6\frac{1}{2}$ " in diameter, is now available for use with the Hydraulic Water Ram, manufactured by **Hydraulic Manufacturing Company, Dept. SPI, Kiel, Wisconsin**. The ram is a plumbing maintenance tool which uses hydrostatic impact to clear clogged drains and sewer lines. The large cone is for use with toilet bowls which have an unusually large diameter, and insures an effective seal when the ram is used on such installations. The oversize cone is an additional accessory and does not replace the smaller standard cone nor the five tapered adaptor plugs which are now furnished as standard equipment.

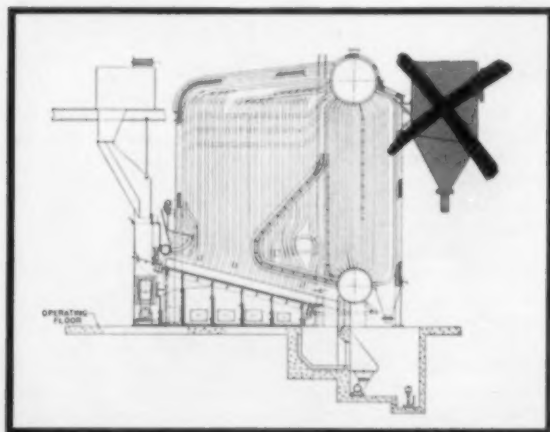
Essentially, the Hydraulic Water Ram is a hand tool consisting of a pressure chamber which is quickly loaded by means of its self-contained compressor (compression of 100 lbs can be raised in 30 seconds). A pressure gauge indicates the pressure which is contained within the chamber. Through use of the easily changeable adaptor plugs or cone sealers, an airtight seal is achieved when the nozzle is inserted in the drain or fixture opening. Discharge is made simply by snapping the trigger resulting in split second impact against the drain blockage.



# Only AE Vibra-Grate Stokers give you these 3 important benefits



**Water-cooled grates.** Water-cooling . . . directly connected to the boiler circulation system . . . guarantees the longest grate life available in any stoker today. Proven maintenance costs are less than one cent per ton of coal. In fact, one major installation has used less than \$200.00 worth of repair parts in over four years of continuous operation!



**Elimination of dust collectors** and cinder return systems. Vibra-Grate burns the coal on the grate . . . dust collection and cinder return systems are not needed. You will never have to be selective in the grade of coal you burn either. Vibra-Grate feeds wet or dry fuel, high or low grade coals. It can burn gas or oil singly or in combination with coal. Overfire air assures complete combustion, giving absolute freedom from smoke at high or low ratings.

**Higher efficiency.** Intermittent vibrating motion of the grate feeds and moves the fuel . . . insuring even, compact distribution on the bed. A combustion-controlled electric timer determines the vibration frequency as required by fuel and steam demand. There are no light spots or holes to reduce efficiency. The grate supports form air-tight zoned sections dampered to permit accurate regulation of undergrate air.

**THE AE VIBRA-GRATE** offers advantages in stoker operation and efficiency that have never been available before, because it is the only stoker which combines the maintenance saving features of water-cooling and the high efficiency features of a vibrating grate and controlled zone undergrate air. Only from Vibra-Grate can you get such dramatic reductions in maintenance costs . . . as well as efficiencies that can't be equalled. Write for complete information on what Vibra-Grate stokers can do for you in terms of lower operating costs.



**AMERICAN ENGINEERING COMPANY**  
Wheatshaf Lane and Sepviva Street • Philadelphia 37, Pa.

Canadian Subsidiaries: Affiliated Engineering Corporations, Ltd.,  
Montreal, P. Q., Bowden Industries Ltd., Toronto, Ont.

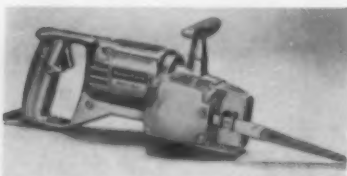
## New Maintenance Product Briefs (Continued)

### Giant Magnets

F-10

In hundreds of industrial plants, small but powerful magnets have become standard maintenance department equipment, according to **Edmund Scientific Company**, Barrington, N. J., which supplies them.

The magnets sold by Edmund are genuine Alnico V type and come in two sizes. The more popular size is a 5-lb horseshoe shaped magnet measuring 3 1/4" high x 2 1/2" wide x 2 1/4" deep. Its strength is about 2,000 Gauss and it will lift over 125 lbs. The giant 15% lb size is about 5-3/16" high and has tremendous lifting power. Its Gauss rating is 5,000-6,000 and it will lift over 250 lbs. Price of the 5-lb magnet is \$8.50 postpaid, while the 15% lb size sells for \$22.50 each, f.o.b.



### Multi-Saw

F-11

A new low priced electric hand saw that cuts up to three times faster than comparable reciprocating saws and gives 30 times longer blade life, has been introduced by the **Porter-Cable Machine Company**, 116 Exchange St., Syracuse, New York. The tool is actually seven saws in one — a rip saw, cross cut saw, coping saw, key-hole saw, scroll saw, jig saw and hack saw.

### Jet-Dri Enamel

F-12

One of the paint industry's latest research developments, Jet-Dri, a product of **Consolidated Chemical & Paint Mfg. Co., Inc.**, 456 Driggs Ave., Brooklyn 11, New York, places a smooth, even-textured coat over concrete, metal and wood equipment and machinery surfaces. Applied by brush, roller, dip or spray, the new resin-base enamel is highly resistant to abrasion, alcohol, corrosion and weathering. The quick dry en-

amel permits use of surface 15 minutes after painting.

In the photo Jet-Dri is applied to the platform of a hand truck. In most instances, a single coat is satisfactory. Painted during a lunch hour, the truck will be dry and ready for use when the operator returns.

Jet-Dri can also be used on loading platforms where, dispatchers and shipping foremen report, the product has shown remarkable durability under heavy traffic.

### Cleaning & Rust-Preventive Solvent

F-13

**Frank A. Hoppe, Inc.**, 2314 N. 8th St., Philadelphia 33, Pa., now offers a rust-pre-

venting Solvent for cleaning industrial machines and metals.

In a wide range of industries, the Solvent is already preferred for such uses as rust removal and prevention, protection of textile needles against humidity and sweating, and the cleaning of dirt, gum, size, crust, lint and oily deposits from all parts of machinery. Other important uses are suggested by the fact that Hoppe's Solvent is easily applied by brush and will not injure cotton, wool, silk, rayon, nylon or any other synthetic yarn.

### Repair Kit

F-14

A new repair kit for industrial use has been put on the market by **Taylor and Art. Inc., Plastics**, 1710 E. Twelfth St., Oakland 6, California.

Liquid and paste plastic compounds in the kit solidify to adhere and lend strength to fractures, tears, holes, or dents in metal, wood, plastic, concrete, ceramic, and other materials.

Tests in the industrial field indicate that many repairs formerly requiring welding, brazing, riveting, or soldering can be done with The Old Pro Kit more quickly without the use of the torch, and without shutting down the plant.

The kit contains one quart each of Flex-Bond, a paste-type plastic resin; WetWeld, a liquid plastic resin; fiberglass cloth, and necessary mixing tools and brushes.

When hardener (a catalyst) is



added, Flex-Bond cures in a matter of minutes to a strong, tough mass, tough as metal, highly adhesive, yet relatively flexible.

WetWeld, the second major item in the kit, is a liquid plastic resin that also cures to solidity with the hardener furnished in The Old Pro Kit. Fiberglass cloth soaked with WetWeld makes exceedingly strong structural repairs.

This combination of fiberglass cloth and WetWeld hardens as strong as metal and will span big holes and tears, will reinforce cracks and fractures. Like Flex-Bond, it will not rust, rot, or corrode. Both materials can be filed, buffed, and painted. WetWeld has the same advantages as Flex-Bond, plus additional bridging strength.

Also in the kit are detailed and fully illustrated instructions for its use.

### Ratchet Repair Kits

F-15

Better service to customers using Proto reversible ratchets can now be offered by all Proto dealers. Complete repairs parts for 1/4", 3/8", and 1/2" drive Proto ratchets are now available in kits from **Proto Tool Co.**, Los Angeles, Calif. Four kits for the same size ratchets are mounted in polyethylene bags on an 11 1/2" x 3" card, which can be displayed on peg board, wall panel or rotating merchandiser hooks. Each kit contains a wheel-plug, two dogs, a lever, a cam, two springs, a cover plate with two screws, and a small diagram which shows the user how he can quickly give his ratchet that new, just-bought feel.

This new kit-packaging eliminates dealer stocking and display problems by requiring only minimum inventory and display space, while offering added service to customers.

## Wire Peeler

**F-16** A new stainless steel casting is helping to peel the tough hide of electric wires, and in the process is making it safer and cheaper than methods used previously.

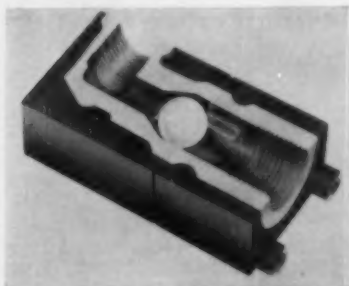
The new method was developed for Georgia Power Company (Atlanta, Ga.) by Penn-Union Electric Corporation (Erie, Pa.) with a stainless steel casting made by **Allegheny Ludlum Steel Corp.**, 20th Floor, Henry W. Oliver Bldg., Pittsburgh 22, Pa.

To operate, the peeler is hooked over the wire or conductor, tightened by hand or with a hot stick (a 6-to-10 foot pole used by power companies for numerous jobs) until a stop is reached, then rotated around the conductor until the "chip" falls away. No nicks are possible since the cutter blade is correctly positioned by a built-in stop. There are 134 different type blades — all interchangeable — with the master peeler. However, since most power companies have only about a dozen different size conductors they need only that many separate types of blades.

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## Fluorocarbon Check Valve

**F-17** Steel - armored Kemlon Check Valves, manufactured by **Keystone Engineering Co.**, 6315 England St., Houston 21, Tex. and featuring all-fluorocarbon construction on fluid surfaces, are said to be impervious to almost every fluid except molten sodium.

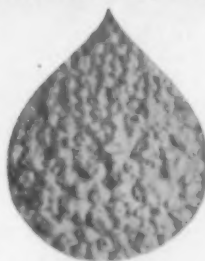


Offered in burst pressure ratings to 1000 psi and above, they are especially recommended for severely corrosive service where valve failures due to balls sticking are a problem. Kemlon valves are available in 1/2", 3/4" and 1" sizes, either threaded or 150# ASA flanged-body styles. Either right-angle or in-line construction may be specified.

# CONCENTROL PROVIDES

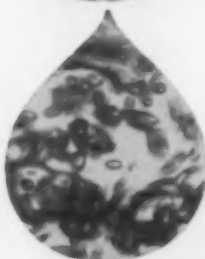
## LOW COST, EFFECTIVE CONTROL of FOAM and BOILER WATER CARRY-OVER

### PROVED IN THE LAB:



#### BEFORE:

Foaming of highly alkaline solutions in glass test cylinder.

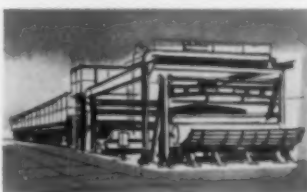


#### AFTER:

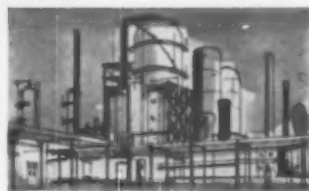
Same solution after addition of 12 ppm of Bird-Archer Concentrol antifoam.

### PROVED IN THE FIELD:

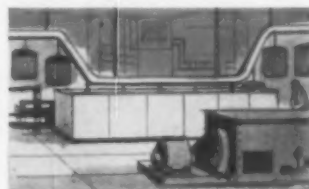
**Concentrol** eliminates foaming, maintains dissolved solids of 10,000 ppm with alkalinity in excess of 2,000 ppm in East Texas refinery.



**Concentrol** reduces blowdown rate from 15% to 5%, keeps steam quality high in paper mill using highly alkaline makeup water.



**Concentrol** eliminates boiler carry-over caused by high alkalinity for an automobile radiator manufacturer using a carbonate water that is Zeolite softened.



**Concentrol** is available in liquid, powder or briquette forms. Fast acting and resistant to hydrolysis or breakdown under normal boiler temperatures and pressures, it can be fed either continuously or in slugs to boilers. Many plants get the advantages of positive foam control *plus* boiler water sludge conditioning by using Concentrol in combination with organic sludge conditioning agents.

Let a Bird-Archer Water Treatment Engineer prove what Concentrol can do in your plant. Bird-Archer is always as near as your phone.



## BIRD-ARCHER WATER TREATING CONSULTANTS

The BIRD-ARCHER Company, 4337 N. American St., Phila. 40, Pa.  
New York, Chicago

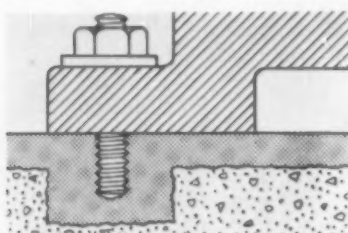
The BIRD-ARCHER CO. of California, 415 Brannan St., San Francisco • Offices in Canada and Mexico

## New Maintenance Product Briefs (Continued)

### Non-Shrinking Grout

F-18

Machinery and structural members are seated more securely in a non-shrinking grouting material introduced by **Walter Maguire Company, Inc.**, 60 East 42nd St., New York 17, N. Y. Unique feature of this new grout is the use of a special aggregate, Cortland emery, a form of corundum, which is second only to the diamond on Mohs' Scale of Hardness.



Named "Emeri-Grout," the new material actually expands slightly as it sets. Its firm grip is further assured by its plasticity before setting. Even in a low water-cement ratio, it is readily worked into restricted spaces without honeycombing or formation of water pockets.

Since it is uncommonly ductile, Emeri-Grout will absorb vibration of heavy machinery without breaking down. It is also highly resistant to erosion by water or oil.

#### Takes 11,000 psi

Emeri-Grout has stood up in test under 11,000 psi compression, and it expands only very slightly. It is recommended for anchoring and maintaining proper alignment of milling machines, boilers, generators and rectifiers, steam engines, etc.

### Fire-Stopping Paints

F-19

Development of new advanced fire-stopping paints rated in Underwriters Laboratories tests as two to four times more effective than other fire-retardant coatings, was announced by the **Alim Corporation**, 11 Park Place, New York 7, N. Y. and the **Baltimore Paint & Chemical Corp.**, 2325 Annapolis Ave., Baltimore 30, Md.

The new "Saf" (Stops All Fires) paints, developed by the Baltimore

firm, perform double fire-protection duty by chemically stopping the spread of flames and insulating building interiors against disastrous effects of spreading heat. The new paint will withstand 1700 degree flames for up to one hour, thus allowing longer periods for escape and arrival of fire equipment.

Properly applied, the new paints are not only smokeless and non-flammable, but chemically impervious to the attack of flames upon wooden, fibre board or metal surfaces. When flames reach the paint, its repelling reaction starts instantly. Like a marshmallow being toasted, the paint puffs up to form continuously layer after layer of flame-retarding, heat resistant coating. This coating, which resembles cellular plastic or foam rubber, keeps forming as flame and heat attack the painted surface, acting both as a fire barrier and as an insulator against the spread of heat. The new paint's insulating quality is fully as important as its fire-retardant capabilities, since the spread and penetration of intense heat causes interior steel and metal structures to collapse, intensifying fire damage.

### Vises

F-20

Two new woodworkers' vises with adjustable steel handles have been announced by **The Columbian Vise & Mfg. Co.**, Cleveland 4, Ohio.



The handle is held in any desired position by a tension spring in the head. With handle centered, operating speed comparable to a rapid-acting vise is possible. Extension of the handle is reputed to give extra leverage for tightening the vise.

The vises also feature a new 3-point mounting, reducing installation time 50%. When mounted, top of vise jaws is approximately 1/8" below bench top. Consequently, top

edge of the bench will help protect sharp tools which might otherwise be damaged by striking the metal jaws of the vise. Bench top can be refinished without removing and re-mounting vises.

Other new features, listed by the manufacturer, are a complete streamlining of the front jaw and elimination of sharp edges. The vise is said to be injury-proof and tamper-proof. Guide rods are hydraulically pressed into the one-piece front jaw assembly.

Vises are available in 4 x 7 and 4 x 10 inch jaw sizes, designated as Models 7CDS and 10CDS. Both have dog type front jaws.

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### Tool Storage Unit

F-21

**Penco Div., Alan Wood Steel Co.**, 200 Brower Ave.,

Oaks, Pa., has announced the availability of a new tool storage unit, Model 181. The unit has 78 compartments for the storage of drills, reamers, taps and other tools. The unit's two top shelves have 15 compartments, each 2-3/16 in. wide, its two center shelves have 13 compartments, each 2-9/16 in. wide, and its two bottom shelves have 11 compartments, each 3 in. wide.



Penco Model 181 tool storage unit is constructed of heavy gauge steel finished in durable oven-baked enamel. Standard colors are gray or green. All compartments are separated by 1 1/2 in. high dividers. All shelves have label holders, turned up to form bin fronts. The unit can be used alone or will fit into standard shelving arrangements. It is 33 1/4 in. wide, 16 1/2 in. deep and 34 1/2 in. high.



## Epoxy Resin Mixing

F-22

A flexurally stronger version of Metalset A-4 that is mixed on a simple one-for-one basis, whether by weight or volume, has been developed by **Smooth-On Manufacturing Company**, 572 Communipaw Ave., Jersey City, N. J. Metalset, a material designed for general maintenance applications, has been repackaged and is now available in tubes of identical size.

This formula is believed to be the first that makes it possible to pack an epoxy compound in units of equal weight and volume, thereby facilitating mixing and reducing waste to a minimum.

The new packaging was selected to illustrate this development. The two tubes are in separate but attached containers of the same size, a visual reminder that mixing is now done by squeezing equal amounts from tubes that are of equal weight and volume. The user mixes only the amount actually needed for each application.

The new Metalset formula was developed not only to simplify mixing but also to provide greater resistance to thermal and mechanical shock in maintenance applications. The application range of Metalset can now be widened because the new material provides a more flexible bond.

## Fungus & Mildew Control

F-23

A new powerful, safe antiseptic solution for effective control of fungus and mildew, called Tremcide, has been announced by **The Tremco Manufacturing Company**, 8701 Kinsman Rd., Cleveland, Ohio. Tremcide is specifically designed for use where condensation or sweating of painted surfaces result in unsanitary conditions of mildew and fungus.

In most cases, Tremcide removes the necessity for scrubbing. It can be brushed on old painted surfaces prior to repainting to kill fungus spores and sterilize the surface to prevent existing fungus from remaining active. No rinsing is required after applying Tremcide — simply allow the solution to dry. This safe, highly effective organic fungicide is also used as a periodic treatment on ceilings and walls after painting to keep the surface sterile.

(Continued on Page 98)

# Coming in July, 1959

## 4th Annual

### **MATERIALS HANDLING ISSUE** Featuring **Case Studies from the South-Southwest**

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Firm \_\_\_\_\_

Position \_\_\_\_\_

Products manufactured  
or nature of business \_\_\_\_\_



# NEW Catalogs & Bulletins

... there is always a **BETTER WAY**

## MAINTENANCE—TOOLS EQUIPMENT & METHODS

- 1—Neoprene Rubber-Coating**—Charcote, a waterproof protective barrier against rust and corrosion described in 4 p bulletin. Offers plant engineer outstanding protection against corrosive fumes, salt spray, abrasion and moisture. — **CHARLESTON RUBBER CO.**
- 2—Electrical Maintenance** — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control & distribution systems, etc., at a cost less than 1% of value of equipment. — Atlanta office of **WESTINGHOUSE ELECTRIC.**
- 5 — Metal Cutters** — Bulletin 655 shows actual cost figures on various metal cutting jobs (bolt, rod, wire, chain, etc.), by using hand and power-operated cutters.—**H. K. PORTER INC.**
- 6 — Gage Glass Cleaning Tool** — Data sheet No. 301 describes tool which uses brushes to quickly and efficiently clean inside of liquid level gage glass.—**JERGUSON GAGE & VALVE CO.**
- 9—Rust Solvent** — Data sheet describes "Liquid Wrench," a penetrating rust solvent that loosens rusted bolts, nuts, screws and "frozen" parts. Safe for all metals and alloys. — **RADIATOR SPECIALTY CO.**
- 10 — Hard Surfacing** — 20 page digest TIS 2821 discusses wear and need for overlays for abrasion, corrosion, friction, heat and impact; case studies; check list of 15 characteristics overlay deposits should exhibit. — **EUTECTIC WELDING ALLOYS CORP.**
- 11—Maintenance Ideas**—"Genius at Work" — Contains ideas about plant maintenance, bits of philosophy, new products and a description of the company's line. — **KANO LABORATORIES.**
- 12—Lubricator Vacuum Type Pumping Unit**—If your plant is experiencing difficulty with visibility and excessive maintenance on lubricator sight glasses, the new 82 vacuum pumping unit will offer lower cost. Form 1263 gives principle of operation and advantages.—**MANZEL.**
- 13—Conveyor Belt Repairs** — Bulletin R-700 and Folder R-4 describe the "Rema" method of making vulcanized repairs without heat. Holes, gouges, rips and tears can be repaired on the job. Curing time delay is eliminated. Belts can be put into service immediately after repair is made.—**FLEXIBLE STEEL LACING COMPANY.**
- 14—Triple-Purpose Gun** — Low-cost Carco Gun (\$16.50) described in form C-100; ideal for fast, efficient sand blast, liquid, or air cleaning of small parts and surfaces. Operates on any standard air pressure system. — **C. A. ROESCH & CO.**
- 19—Sealing Compound**—Data sheet describes Tite Seal for leakproof, pressure-tight connections. Gasket and joint compound heat and vibration proof. Prevents rust and corrosion. — **RADIATOR SPECIALTY CO.**
- 22—Lubricator Alert** — Data sheet describes lubricator flow switch that indicates positive flow at terminal points on any force feed lubricator system. Easily installed on any existing application. Indicates lack of flow to the point of injection. — **MANZEL.**
- 23 — Boiler Gaskets** — Catalog describes wire-inserted woven asbestos and spiral wound metal-asbestos — for manholes, handholes and tube caps of all makes of stationary and marine boilers, water walls, economizers, etc. — **THE BELMONT PACKING & RUBBER.**
- 29—Belting Repairs** — Two bulletins "How to Properly Join Belts" and "Belt Fastener Selection Chart" offer service help on conveyor, elevator and transmission belting. — **CRESCENT BELT FASTENER CO.**
- 31 — Stack Maintenance** — How wrought iron offers unique defense against flue gas corrosion described in bulletin "Wrought Iron for Flue Gas Conductors."—**A. M. BYERS COMPANY.**
- 32 — Scale Removal** — Data sheet on Kwik-Kleen, a completely safe method of rapid scale removal for heat transfer surfaces. — **THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.**
- 33—Air Compressor Rod Packing** — Catalog 56 shows how "Compressor" No. 760 stays flexible under intense dry heat and protects rods from premature wear.—**THE BELMONT PACKING & RUBBER CO.**
- 43—Belt Clamps** — Bulletin FP-1 describes new lightweight durable belt clamps that can be easily operated by only one man. Can be used for installing new belt splices or for shortening belts.—**FLEXIBLE STEEL LACING CO.**
- 45 — Correct Lubrication** — "Lubriplate Data Book" shows importance of providing and maintaining proper and economical maintenance of all types of plant machinery thru adequate lubrication. — **FISKE BROTHERS REFINING CO.**
- 58—Tube Expander Drives** — Bulletin 581 gives data on complete line of Torq-Air-Matic automatic tube expander drives and explains the importance of precision control in tube expanding. Chart to aid selecting right model for the right job. — **THOMAS C. WILSON, INC.**
- 64 — Anti-Corrosive Paints** — Bulletin "The Application of Subox and Subalox Paints" — Gives the story of a complete paint system for weather, moisture and alkali protection, with details as to application.—**SUBOX, INC.**
- 70—Multi-Purpose Grease** — Bulletins describe new single product Gulfcrow grease (4 consistencies) that does the work of many—simplifies application and avoids errors, reduces inventory and cuts lubrication costs; grease gun or centralized system application. — **GULF OIL.**
- 84—Zinc Coatings** — Bulletin describes Galvanox, a special zinc coating applied as a paint to pro-

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vide galvanic protection to metals.  
— SUBOX, INC.

**90—Ultrasonic Cleaning** — Machines for maintenance and repair of instruments and gages described in general catalog; also shop equipment and hand tools for instrument and gage repairs. — R. P. GALLIEN & SON.

**95—Plant Lubrication** — The Lubriplate Service Handbook — Gives valuable information on the subject of lubrication in all its forms, intended to be of everyday use to plant superintendents, managers, maintenance engineers and those in charge of plant production and maintenance. — LUBRIPLATE DIVISION, FISKE BROTHERS REFINING CO.

**97—Maintenance Coatings** — Gaco Hypalon (duPont) coatings and liquid linings described in literature; unaffected by ozone, have unusual weather and abrasion resistance, and suitable for continued use at elevated temperatures. — GATES ENGINEERING COMPANY.

#### FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

**120 — Continuous Blow-Off Equipment** — Publication No. 5700 shows how equipment can effect substantial savings in heat and fuel by returning the heat contained in the blow-off. System also maintains uniform dissolved solids concentration in boiler. Typical applications and lists of users are included. — COCHRANE CORPORATION.

**152—Stainless Steel Pump** — Bulletin 725.4 describes pump for economical handling of hot, corrosive or abrasive liquids; 9 sizes with capacities up to 720 gpm; heads to 200 ft. — GOULDS PUMPS INC.

**192—Induced Draft Fans** — Catalog 905 describes the new Type DN Dynacurve fans offering minimum floor space & height requirements, and high efficiency over wide performance range. — CLARAGE FAN COMPANY.

#### INSTRUMENTS—METERS CONTROLS—REGULATORS

**200 — Control Centers** — Built to specific needs of the job to prevent costly breakdowns later. Units custom-built from best components. Specializing in quick deliveries. — THOMAS B. COMBS COMPANY.

**201—Valves & Gages**—Handy guide No. 36 gives data & prices on valves, liquid-level gages & accessories for process and power industries. — PENBERTHY MFG. CO.

**206—Process "Indicator"** — Catl. 100 B shows how you can have maximum info on all process variables with Panalarm annunciators. Trouble anywhere is signalled instantly — before it can grow big and expensive. — PANELLIT, INC.

**209—Liquid Level Controls**—Catalog describes controls for almost any liquid, at any pressure, at any temperature. Can be furnished in top-mounting, side-mounting styles, or as external float cage units. Almost unlimited application. — MAGNETROL, INC.

**252—Water Columns, Gages, Equipment** — Brochure AO — Introduction to low pressure (0 to 250 psi) division of catalog data. Explains principles and construction of Reliance low pressure alarm water columns, and lists accessory equipment. — RELIANCE GAUGE COLUMN CO.

**271—Temperature Control Valve** — Bulletin J-180 covers self-operating valve with sliding gate and plate; eliminates need for pressure reducing valve on high inlet pressures. — JORDAN CORPORATION.

**286—Feedwater Regulator** — Bulletin 1055 describes the Flowmatic Type P feedwater regulator, applicable for marine or stationary service. Gives mechanical description of components and schematic diagram showing suggested piping arrangements. Also specification table. — COPES-VULCAN DIV.

**293—Metering & Control Systems** — 4 p Bulletin 500 discusses pneumatic and electric telemetering. Includes pneumatic control and detailed literature references for all products making up metering and control systems. — BAILEY METER CO.

#### PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

**300—Fact Folders** — 23 up-to-date industrial fact-file folders on aluminum, steel, copper, stainless steel, insulation, roofing and other industrial supplies immediately available from 9 Southern warehouses. — REYNOLDS ALUMINUM SUPPLY CO.

**302—Aluminum Jacketing** — Independent laboratory heat loss report proves jacketing saves money for power plants by increasing efficiency of any insulation. Cost is less than canvas and paint. As a bonus you get a better looking plant and easier housekeeping. — CHILDERS MANUFACTURING CO.

**304—Backing Rings** — Bulletin 56-2 describes rings designed for fast, economical fit-up in piping, tubing,

fittings and valves. Shows how rings assure uniform complete-penetration welds and ease of handling in both shop and field. Carbon steel, wrought iron, chrome alloys, stainless, aluminum and copper.—ROBVON BACKING RING COMPANY.

**306 — Steel Buildings** — Shed roof, gable roof frameless and gable roof rigid frame units described in Catalog SX-13757. 5,000 sizes available to meet all space needs. — ARMCO DRAINAGE & METAL PRODUCTS.

**313—Ice Making Machine** — Packaged unit ideal for remote locations in sizes from 150 lb/day to 2000 lb/day; choice of electric motor or gasoline engine drive. — EQUITABLE EQUIPMENT CO.

**327—Steam Fan Heater** — Bulletin 109 discusses heater design which makes full use of all latent and sensible heat in steam up to 200 lbs without requiring expensive piping and pressure reducing stations. Applicable to large plant heating or process.—NIAGARA BLOWER CO.

**348—Building Drainage** — 64 p bulletin describes the advantages of 4-D wrought iron for soil, waste, vent and downspout piping. Includes sections on corrosive conditions, comparative service, costs, Durham systems, and photographic surveys on vent corrosion. — A. M. BYERS CO.

**353—Storage Batteries** — 24 p Bulletin 210 reports on engineering studies of the effect of temperature on battery capacity. Provides tabulated data and general information necessary for selection of batteries and charging equipment, proper battery and charger maintenance, selection of battery racks and determination of battery discharge ratings.—EXIDE INDUSTRIAL DIVISION.

**380—Compressed Air Dryers** — 12 p Bulletin describes heatless air dryers that extract both water and micronic particles; reduce moisture to zero dewpoint. 23 sizes range from 25 cfm for single instrument to 3000 cfm for entire plant air system. — VAN PRODUCTS CO.

**386—Rigid Frame Buildings**—8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bow-string truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

#### PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

**416—Control Valves**—Illustrated Cat. 305 contains detailed specifications on air-operated control valves.

## Bulletins (Cont.)

All usual types are described. Technical data are included as an aid to selection. — MASON-NEILAN DIV.

**419—Small Gate Valve** — Multiple applications of small forged steel gate valve noted in Catalog 10. Low maintenance. Sizes from 1/4" to 2"; rising stem with yoke or rising stem with inside screw; Pressures from 380 psi at 1000 F to 2000 psi at 100 F. — THE CHAPMAN VALVE MFG. COMPANY.

**425 — Steam Trap** with only three parts — cap, disc and body described in Bulletin 257. No valve closing mechanisms. Only moving part is solid stainless steel disc. Same trap for all loads and pressure 10-600 psi. — SARCO COMPANY, INC.

**429—Expansion Joints** — 8 p Bulletin EJ-1915 describes Type W Gun-Pakt expansion joint which features an improved one-piece design of body and gland. Includes data on figuring expansion of pipe lines and suggestions for installing expansion joints. — YARNALL-WARING CO.

**435—Liquid Level Control** — Cat. 405 gives full details and specifications of wide-range types of controls for a wide variety of applications. Employ torque tube packless design. Six types of mounting connections. — MASON-NEILAN DIV.

**451—Aluminum Jacketing & Elbows** — Folder J-1 describes aluminum protection for insulated lines, elbows, towers, vessels and tanks. Jacketing in 5 thicknesses, 2 alloys. Ell-Jacs in 60 sizes both for 90° and 45° ell. — CHILDERS MANUFACTURING CO.

**461 — Reducing Valves** — Bulletin 1027 describes diaphragm and piston operated regulating valves level control. Complete specifications for pressure, temperature and liquidations. — COPES-VULCAN DIV., BLAW-KNOX CO.

**484—Threading Wrought Iron Pipe** — A service manual which discusses in detail the proper threading of wrought iron pipe, both from the theoretical and practical standpoints. Illustrated with many helpful views. — A. M. BYERS COMPANY.

### BOILERS—STOKERS TURBINES—BURNERS

**505—Refractories** — Paco High Heat Duty and Super Duty Plastic Refractories. Fire brick, high tempera-

ture cement, castables. Installation and engineering service. Free estimates and inspections. — NORTH STATE PYROPHYLLITE CO.

**524—Packaged Firetube Boiler** — Bulletin No. MR-1 describes Model R Generator which retains the exclusive 3 pass concentric tube design and incorporates new operating and maintenance advantages. — AMES IRON WORKS.

**531—Fuel Oil Treatment** — Data sheet describes how Mogul treatment disintegrates, dissolves and disperses sludge in fuel oil storage tanks and equipment. Thru sludge dispersal, maximum vaporization and combustion are possible. — THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

**535—Unit Steam Boilers** — Catalog AD-100 — Gives complete information on oil and gas fired "Self Contained" boilers, 15 to 500 hp, 15 to 250 psi for processing and for heating. Gives features, applications, efficiencies, capacities and dimensions. — CLEAVER-BROOKS CO.

**547—Gas and/or Oil Burners** — Bulletin B1 describes large or small, single or dual fuel, packaged or field assembled, atmospheric or forced draft; electronic of all types; competent sales and service. — WEBSTER ENGINEERING CO.

**562—Stokers**—Catalog 525 describes and illustrates the complete line of underfeed and overthrow spreader stokers. Sizes for boilers from 3,000 to 400,000 lb/hr steam capacity. — DETROIT STOKER CO.

**574—Packaged Generator**—Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specification data. Available with gas, oil, and combination gas/oil fuel systems. — TEXSTEAM CORP.

**583—Steam & Hot Water Generators** — Booklet describes company's line of fifteen compact models from 18 to 500 hp (15 to 200 psi). Only five connections needed; no special foundation. — CYCLOTHERM DIVISION.

### ENGINES—DRIVES POWER TRANSMISSION MATERIALS HANDLING

**612—Hydraulic Ash Conveyors** — Bulletin S57 describes how to cut costs but maintain high operating efficiency with hydraulic ash conveyors. — NATIONAL CONVEYORS CO. INC.

**622—Pneumatic Conveyor Systems** — 4 page Bulletin P58G de-

scribes many types of pneumatic conveyor systems for handling bulk materials. — NATIONAL CONVEYORS CO., INC.

**630—Mechanical Vibrating Conveyors** — Catalog 890 gives information on conveyability and density of typical solid materials and provides data on how to "Do It Yourself" to get required length. — JEFFREY MFG. CO.

**631—Screw Conveyors**—Catalog ID-541, 68 pages — Illustrates and describes standard and special types of conveyors, with engineering data necessary for selection. Tables give sizes, types, speeds, horsepower and other information. Accessories included. — CONTINENTAL GIN COMPANY.

**638—Idlers**—Bulletin 925 details the Permaeal Idler's development from laboratory to installation. Outlines Double Flexible Diaphragm Seal which keeps grease in and dirt out. — JEFFREY MANUFACTURING CO.

**648—Belt Fastening Tools** — Bulletins F-110 and F-111 — Describe new Flexco power tool wrenches and power tool boring punches, designed to speed up fastening of wide conveyor belts; and give recommendations on the use of various impact tools connected therewith. — FLEXIBLE STEEL LACING CO.

### WATER TREATMENT—HEATING & AIR CONDITIONING—DUST & FUME CONTROL—REFRIGERATION

**704 — Water Conditioning** — Brochure describes company's engineering services — zeolite water softeners, filters and purifiers, modernized and rebuilt water softeners, aerators and degasitors and process and boiler water conditioning. — SOUTHERN WATER CONDITIONING, INC.

**706—Automatic Roof Cooling**—Bulletin shows how automatic evaporative roof cooling can reduce inside temperature 8 to 15° without air conditioning; increase roof life; and reduce fire hazards. Many Southern installations. — APRIL SHOWERS — SOUTHERN.

**723—Dust Collection** — Catalog describes mechanical and electrical systems which meet most rigid anti-air-pollution codes; low resistance fly ash collector which combines top efficiency with low draft loss for natural or forced draft installations. — BUELL ENGINEERING COMPANY.

**727 — Algae Inhibitor** — Algicide bulletin describes simple, effective and economical way to get rid

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## Bulletins (Cont.)

of algae troubles in humidifiers, air washers, condensers, heat exchangers, and other systems where water is exposed to atmospheric contamination. — THE NORTH AMERICAN MOGUL PRODUCTS CO.

**728—Demineralizing**—40 page handbook 5800 compares various methods of water treatment, including evaporators, with demineralizers. Lists characteristics of various types of cation and anion exchange materials; includes technical data, recommends types of units to meet varying conditions. Photos and flow diagrams are shown and installation cases reported.—COCHRANE CORPORATION.

**733—De-Ionization** — Reprint on "Counterflow Regeneration" a new method of ion-exchange, which combines chemical advantage of up-flow with proven mechanical advantage of downflow. — ILLINOIS WATER TREATMENT COMPANY.

**755 — Cooling Tower** — Bulletin DVAQ describes the double-flow Aquatower for industrial services involving intermediate-gallon-

ages. Space saving line in wood or steel structure with asbestos cement board casing, in single or multi-cell units. — THE MARLEY COMPANY.

**784—Refrigeration Valves and Fittings**—Catalog 0, 40 pages—Describes valves and fittings for ammonia, Freon and other refrigerants, for use in industrial refrigeration, ice making and air conditioning.—FRICK CO.

### ELECTRICAL

**806—Motor Control** — Condensed price catalog lists commonly used motor control up to and including Size 4 rating, plus push buttons, limit switches and other accessories. — ALLEN-BRADLEY CO.

**849—Electric Heating Units** — 24 page Catalog 27-620 covers strip, oven, immersion and bolt heaters. Heating problems & solutions are discussed. — WESTINGHOUSE ELECTRIC CORP.

**855—Wiring Analyzer** — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or

slide rules.—SPRAGUE ELECTRIC COMPANY.

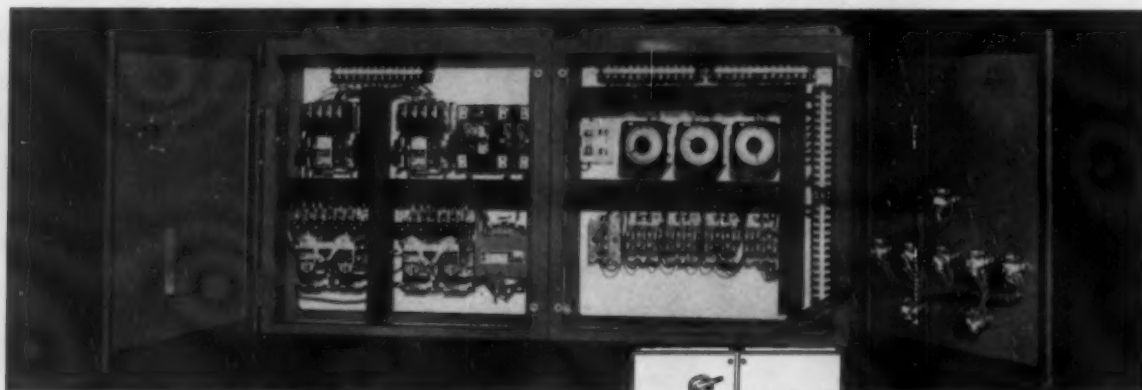
**859—FHP Motors** — 16 p Bulletin GEA-6424 illustrates design advantages and shows components in integrated insulation system of general purpose fractional hp motors. Used on power tools, heating and ventilating equipment, compressors, fans, water pumps, and machine tools. — GENERAL ELECTRIC CO.

**871—Electrical Protection** — Protection Handbook — Tells how to protect motors, apparatus and circuits. Gives National Electrical Code requirements in simplified form. Designed to help the electrical or plant maintenance engineer. — BUSSMANN MFG. CO.

**874—High-Voltage Cable** — Bulletin EB-27 gives full details on performance of Type AB insulation in 15 Industry Specification Tests, including operating temperature. — ANACONDA WIRE & CABLE COMPANY.

**889—Transformers** — Open dry-type units, rated 300 kva and above, 15 kv and below to meet general industrial requirements described in Bulletin GEA-6668. Three types of high-voltage terminations. — GENERAL ELECTRIC CO.

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## Maintenance Bulletins

### S-1—Solving Corrosion Problems —

24 page booklet describes how Duplex Tubes help solve corrosion problems in condenser and heat exchanger equipment in petroleum refineries, chemical & petrochemical plants, food processing installations, etc. Includes information about heat transfer efficiencies, design and installation data. Offers check list of applications which indicates metal combinations which best resist attack for generally used corrosive media. — BRIDGEPORT BRASS CO., 30 Grand St., Bridgeport 2, Conn.

### S-2—Wear-In Compound — Bulletin

120 discusses effectiveness of Molykote Wear-In Compound in eliminating damage due to improper breaking-in of new or rebuilt machinery. Also an excellent lubricant for other troublesome friction applications in average machine shop. — ALPHA-MOLYKOTE CORP., 65 Harvard Ave., Stamford, Conn.

### S-3—Calibration System — 16 page

catalog tells how to calibrate newest types of process control systems. Particular emphasis placed on testing and calibration of systems which use proportional currents for signal transmissions and telemetering. — TECHNIQUE ASSOCIATES, INC., 1413 North Cornell Ave., Indianapolis 2, Indiana.

### S-4—Silicon Chargers — 4 page Bulletin

6258 describes features which help maintain constant voltage at battery terminals over complete range from zero to full load. Included is a chart for determining proper size and model of silicon-rectifier charger to be used with stand-by batteries. — EXIDE INDUSTRIAL DIV., ELECTRIC STORAGE BATTERY CO., Rising Sun and Adams Ave., Philadelphia 20, Pa.

### S-5—Portable Pneumatic Grinders—

12 page, loose-leaf Catalog PT-58 gives data on four models of pneumatic grinders, two with a speed of 60,000 rpm and two with a speed of 40,000 rpm. Horizontal grinders with speeds from 3100 to 12,000 rpm are also described and illustrated, along with selection tables. Includes data on auxiliary equipment. — THOMAS C. WILSON, INC., 21-11 44th Ave., Long Island City 1, N. Y.

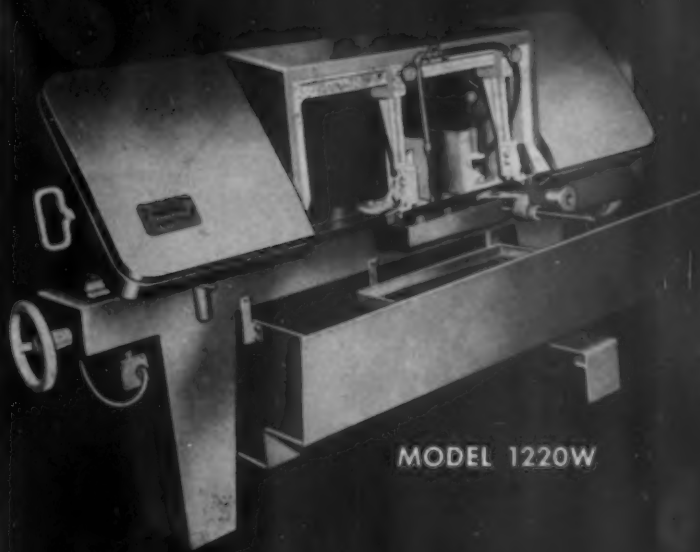
### S-6—Corrosion Prevention — Bulletin

93XG describes the Metco Metallizing Systems — pure metals firmly bonded to a steel base by metallizing. — METALLIZING ENGINEERING CO., INC., 1101 Prospect Ave., Westbury, Long Island, N. Y.

# KALAMAZOO

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For a big, fast machine that will give you high-production sawing of 12-inch round stock, 20-inch flat and 12-inch pipe—and maintain hair-line accuracy—write for complete details or contact your local Kalamazoo distributor.



MODEL 1220W

MACHINE TOOL DIVISION

## Kalamazoo TANK and SILO COMPANY

1958 Harrison Street • Kalamazoo, Michigan

**S-7—Air Hoists** — 8 page Brochure 5145 gives specifications, operating data and accessory information on air hoists built in capacities from 1000 to 2000 lb in hook or trolley types. — YALE & TOWNE MFG. CO., 11,000 Roosevelt Blvd., Philadelphia 15, Pa.

**S-8 Maintenance** — 24 page booklet "How to Make Your Own Machine & Repair Parts Quicker & Easier" helps solve maintenance and repair part problems. Covers care and trouble-shooting of machines and equipment, machining and welding techniques and contains drill hole tolerances and a grinding limits chart. — LA SALLE STEEL CO., Box 6800-A, Chicago 80, Ill.

**S-9—O Rings** — Bulletin AD-148 deals with the design and application of "O" Rings — materials of construction, dynamic and static applications, use of back-up or non-extrusion rings, and groove design for this style of packing. — THE GARLOCK PACKING CO., 432 Main St., Palmyra, N. Y.

**S-10—Hoists & Cranes** — 8 page Folder DH-28 illustrates company's line of hoists and cranes. Contains data on general features, construction details, weights, dimensions, suspensions, specifications, clearances,

accessibility, etc. — AMERICAN CHAIN & CABLE CO., INC., 929 Connecticut Ave., Bridgeport 2, Conn.

**S-11—Dustless Concrete Drilling** — Folder provides specifications and operation details on Thor No. 15 DL dustless concrete and rock drilling hammer and companion dust extractor. "Inhaling" air hammer drills holes 13/16 to 1 1/4 inches. — THOR POWER TOOL CO., 175 N. State St., Aurora, Ill.

**S-12—Masonry Anchors** — Brochure describes Slugin, the compounded masonry anchors used for heavy-duty fastenings to masonry and concrete construction with standard machine bolts. Gives technical data on tensile, shear and compression strengths. — STAR EXPANSION INDUSTRIES CORP., Mountainville, N. Y.

**S-13—Fiberglas Ladders** — 4 page bulletin describes fiberglas ladders, which combine fiberglas reinforced side rails with non-twisting aluminum rungs, which are plastic-welded to become an integral part of the ladder. Combines lightweight strength of metal with non-conducting qualities of dry wood ladders — are splinter free. — PUTNAM ROLLING LADDER CO., INC., 32


Howard St., New York, N. Y.

**S-14—Flashover Prevention** — Brochure describes how company's 5 Compound curtains arcs, shorts, and the formation of leakage paths on insulators exposed to contaminated atmospheres. Illustrated. — DOW CORNING CORP., Midland, Michigan.

**S-15—Electrical Maintenance** — Catalog C 758 illustrates and describes company's line of electrical maintenance equipment — staples, bushings, knockout plugs, insulators, terminal blocks, connectors, etc. Catalog P 758 includes the prices for this equipment. — BUCHANAN ELECTRICAL PRODUCTS CORP., Hillside, New Jersey.

**S-16—Power Lubrication** — 32 page Catalog 81 describes company's line of lubricant application equipment, fittings and accessories. Application can be made on any kind of machine that has a bearing surface which requires a lubricant. — LINCOLN ENGINEERING CO., 5702-24 Natural Bridge Ave., St. Louis 20, Mo.

**S-17—Precision Tools** — Illustrated Bulletin M81 describes personal and shop tools designed for greater



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## Maintenance Bulletins

(Continued)

accuracy and easier use. Specifications and prices included.—BROWN & SHARPE MFG. CO., Industrial Products Div., Providence 1, Rhode Island.

**S-18—Coupling Link**—Bulletin CL-1 describes the Coupl-loy Link, an alloy link, especially designed to make on-the-spot chain slings and assemblies. Includes reference charts, selection data, load limits and load charts. — THE MCKAY CO., 1005 Liberty Ave., Pittsburgh 22, Pa.

**S-19—Fire Retardant Paint & Epoxy Chemical Resistant Enamel** — Bulletins give information on these two types of coatings, where to use them, and how to apply them. — E. I. DU PONT DE NEMOURS & CO., Finishes Div., Wilmington 98, Del.

**S-20—Replacement Belts** — Catalog V-173-B illustrates and describes replacement belts for Variable Speed Units. Carries alphabetical listing by make and model of units, interchange guide with other makes of belts, and numerical listing and list prices. — BROWNING MFG. CO., Maysville, Ky.

**S-21—Chemical-Resistant Lining** — Bulletin 171-77 describes Saraloy 898 chemical-resistant sheet to protect metal components in chemical processing systems. — SARAN LINED PIPE CO., 2415 Burdette Ave., Ferndale (Detroit) 20, Michigan.

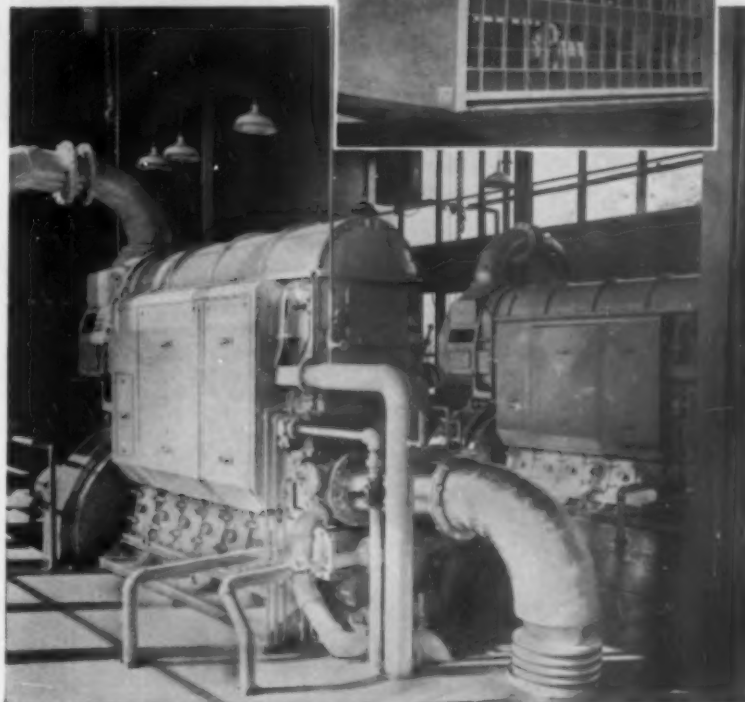
**S-22—Metal Gaskets**—Bulletin AD-104 describes the design, construction and utility of Guardian spiral wound metal gaskets and lists various types available for special applications. — GARLOCK PACKING CO., 434 Main St., Palmyra, N. Y.

**S-23—Soldering Aluminum** — Technical brochure includes data on soldering fluxes, irons and flames, and gives complete information on actual soldering methods. Types and properties of aluminum solders are explained, plus the corrosion of soldered joints and their performance in aluminum. — REYNOLDS METALS CO., Dept. PRD-6, Box 2346, Richmond 18, Va.

**S-24—Shot Cleaning** — Bulletin 2145 describes new shot cleaning system for removing soot and ash deposits from horizontal superheaters, economizers and reheaters as well as internal surfaces of tubular air heaters. — DIAMOND POWER SPECIALTY CORP., Lancaster, Ohio.

Modern power plant, with two F-M O-P diesels, insures uninterrupted power supply.

Modern 38D8-1/2 F-M O-P diesels, each rated at 625 h.p., direct-drive F-M 540-KVA 432 Kw. alternators.



# Miner installs power security!

In line with an increasing trend among institutions and industries, the new William H. Miner Agricultural Research Institute near Chazy, New York has installed a complete Fairbanks-Morse diesel-electric plant as positive protection against power failure.

The compact installation shown above features two Fairbanks-Morse Opposed-Piston diesels, direct-driving Fairbanks-Morse alternators.

The plant is completely self-

sufficient. Should the area's hydro power supply fail, a 6-kw. Model 45 F-M diesel-generator set powers a motor-driven starting air compressor and pre-lube pumps to let the operator start one of the big F-M diesels in a hurry.

Find out why F-M two-cycle Opposed-Piston diesel power is unsurpassed for compactness, dependability and economy. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.



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DIESEL, DUAL FUEL AND GAS ENGINES • LOCOMOTIVES • ELECTRIC MOTORS • GENERATORS  
PUMPS • SCALES • COMPRESSORS • MAGNETOS • HOME WATER SYSTEMS

## New Maintenance Product Briefs (Continued)

### Triple-Purpose Gun

**F-24** The Carco triple-purpose gun by C. A. Roesch & Company, 1233 So. Hope St., Los Angeles, Calif., is ideal for fast, efficient sand blast, liquid, or air cleaning of small parts and surfaces. Gun, selling for approximately \$16.50, operates on any standard air pressure system.

**Sand Blasting** — Number 30 mesh, silica sand recommended for average work. The Carco Gun operates on air pressures of 75 lb and upwards. Maximum efficiency for sand blasting is obtained with air pressures of 100 to 140 lb.

**Liquid Cleaning** — Remove jar. Work trigger several times to remove sand particles. Place finger over end of nozzle, working trigger to allow sand particles to escape thru connection. Attach a 3 ft rubber hose to the side of gun allowing other end of hose to dangle in liquid being used.

**Air Cleaning** — Same as above,



except rubber hose is not necessary. To clean refuse away while sand blasting, simply turn gun upside down, allowing air only to go thru gun.

### Tank Cleaning Tool

**F-25** A specialized new tool for applying solvents used in chemically cleaning storage tanks has been announced by

Dowell Division of The Dow Chemical Company, Tulsa, Okla. It uses high-velocity streams of chemical solvents to remove scale, sludge, and other undesirable deposits from internal tank surfaces.

The new tool jets solvents from two nozzles in a revolving jet head powered by a hydraulic motor. The jet head rotates through 360° both horizontally and vertically, thus solvents contact all internal tank surfaces.

Solvents reach the jet head through a line from a special truck-mounted pump outside the tank. Other lines carry the fluid that powers the hydraulic motor.

Cleaning tanks chemically with this new tool offers several advantages. After the unit is installed, the cleaning service can be controlled from outside the tank. Thus personnel are not exposed to toxic fumes or solvents. Time required for cleaning is less than with mechanical methods, and cleaning is usually more thorough. In addition, Dowell personnel conduct the entire cleaning operation, releasing skilled plant craftsmen for other duties.



### ONE-PIECE PLASTIC FURNACE LINING

**saves fuel and reduces downtime!**

For original installations or repairs—none compares with economical, long-life PACO PLASTIC! Made from the mineral pyrophyllite in three grades with P.C.E. ranging from 3040° to 3225° (cone 34-35). Material does not soften below rated fusion point. Forms a solid, joint-free monolithic lining that prevents spalling, gas and heat leakage. Quickly applied by unskilled labor and can be fired immediately. Free estimates!

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Queen City Engineering Co., Charlotte, N. C.  
Kincaid Engineering Co., Gastonia, N. C.  
J. L. Goodman & Son, Hickory, N. C.  
Joe Moore & Company, Raleigh, N. C.  
Summers Hardware & Supply Company, Johnson City, Tenn.  
McBurney Stoker & Equip. Co., Atlanta, Ga.  
Brown-Rogers-Dixon Co., Spartanburg, S. C.  
Way Fire Brick Co., Churchland, Va.  
Muse, Inc., Johnson City, Tenn.



### Heavy Duty Shelf Truck

**F-26** Designed for heavy duty industrial usage by Bay Products, Inc., 1817 W. Cambria St., Philadelphia 32, Pa. this steel shelf truck has 3" easy-roll casters with rubber wheels, which make pushing and steering effortless even when heavily loaded. All trays, except the bottom one can be inverted to form flat top shelves. These trucks are available in both 18" x 30" and 24" x 36" tray sizes and are 36½" high. Finish is super-durable forest green baked enamel applied over phosphate rust inhibition.



## C-Clamps

**F-27** Featuring a swivel pad that is guaranteed never to come off, the new line of forged steel C-Clamps announced by **Proto Tool Company**, a Los Angeles division of Pendleton Tool Industries, Inc., offers extra-deep throats, heavier, sturdier spindles. The new line is available in 2", 3", 4", 6", 8", 10", and 12" capacities, with minimum proof tests from 2700 to 8000 pounds.

## Concrete Floor Protection

**F-28** Whether floors are new or old, **Plio Con**, from **Monroe Co., Inc.**, 10703 Quebec Ave., Cleveland 6, Ohio, will seal, harden and dust-proof concrete floors. It protects and extends the life of concrete.

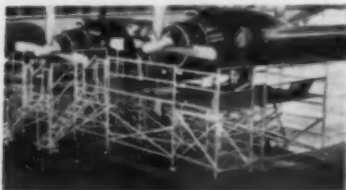
Plio Con is especially recommended for concrete floors in warehouses and factories. Your floors are safer, much easier to keep clean, and equipment rolls easier.

Easily and quickly applied with a lamb's wool applicator or mop, it sets up dust-free in 1 hour, dries to the touch in 3. It blends in perfectly allowing for quick, easy touch-up and will not discolor with age.

For More Free Data **FILL IN CODE NO.** on the Handy Return Card — Page 89

## Aluminum Scaffolding

**F-29** A 75% more efficient method for servicing aircraft through use of portable platforms of aluminum scaffolding, manufactured by **Up-Right Scaffolds**, 1013 Pardee Street, Berkeley 10, California, has been reported from Braniff Airways, Dallas, Texas.



Lightweight and easily assembled by two men into any configuration, the scaffolds service all four engines and nose of the aircraft at one time. Can be rolled by one man for service inside or outside hangar. Used currently on the DC7C and DC6... later on the Lockheed Electra.

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# FANS

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*low initial cost*

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You save money when you install quiet, efficient fans — oscillators, air circulators and both belt-drive and direct-drive exhaust fans — backed by the Emerson-Electric famous factory-to-user guarantee.

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## New Maintenance Product Briefs (Continued)



### Paint Heater

**F-30** A new paint heater that provides safe heat with a direct type of heater element has been announced by **Binks**

**Manufacturing Company**, 3122 W. Carroll Ave., Chicago 12, Ill.

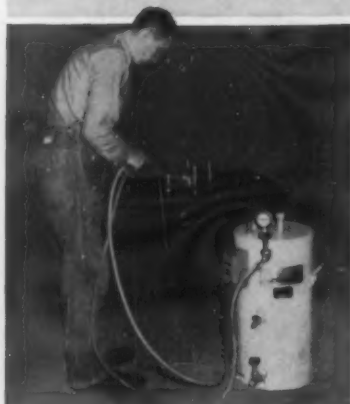
By having the heater element in the center of the paint tract, maximum heat transfer efficiency is obtained without the dangerous high temperatures that are found in ordinary electric heaters.

The paint tract consists of 22 long slots or passageways equally spaced around the outside diameter of a cylindrical aluminum block. The heater element is in the center of the block. Passageways are arranged so that all the paint entering the heater must pass through each of them before leaving the heater.

Since the heat is emitted radially from the center of the block outward, it must pass through the paint before it is dissipated, thus assuring the greatest possible efficiency.

The new paint heater is available for either circulating or non-circulating paint systems, and for 115 or 230 volt operation. Either model features a 1500 watt heating element, each has a capacity of 30 ounces per minute delivery at a maximum temperature of 160 F.

## VERSATILE, NEW PLUG-IN STEAM GENERATOR



Series "R" **SPEEDYLECTRIC** generates steam to 250 psig. and temperatures to 405° F. Write today for Bulletin SG-200. Larger capacity Steam-Jet Cleaners available. Write for Bulletin JC-100.

### Easily Converted to a Steam-Jet Cleaner!

For plug-in operation on 110- and 220-volt circuits, the precision-built, compact, ASME Code Series "R" **SPEEDYLECTRIC** steam generator is ideal for laboratory, pilot plant and even production processes requiring small volumes of high-pressure steam!

This midget-size **SPEEDYLECTRIC**, like all **SPEEDYLECTRIC** models, features safe, simple, electrode heating with precise current control. Easily converted to a Steam-Jet Cleaner for sterilizing and de-icing, by means of an accessory kit.

See our catalog in Sweet's "Plant Engineering" File.

**Pantex**

**MANUFACTURING CORPORATION**

P. O. Box 660 AX

Pawtucket 5, Rhode Island

G-381

## Stainless Steel Solder Alloy

**F-31** StainTin 157-PA, a completely new solder-type alloy in convenient paint-on paste form for stainless steels has been developed by **Eutectic Welding Alloys Corp.**, 40-40 172nd St., Flushing 58, N. Y.

The operator merely paints the paste on the surface, and applies heat, preferably indirect, until the alloy flows and bonds at approximately 450 F.

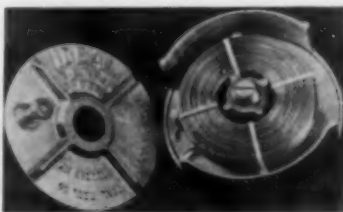
Unlike common solders, StainTin 157-PA is completely free of volatile elements such as cadmium and lead. Deposits will provide up to 15,000 psi tensile strength, depending upon joint design. The alloy is highly oxidation-resistant, remaining shiny under normally corrosive conditions. It is highly recommended for food contact applications. StainTin 157-PA, in addition to stainless steel, can also be used with steels, copper alloys and nickel alloys.

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## Copper-Covered Tie Wire

**F-32** Pre-packaged copper-covered steel wire has been introduced for use with tie wire reels for fastening pipe insulation where salt spray and other corrosives prevail by the **National Standard Company**, Niles, Mich.

The pre-packaged wire, known as Copperply, is 16 gauge, with 15 per cent copper by weight. This provides a 1% mil protective copper coating around the steel core.



Made by continuously electroplating copper concentrically around a steel core wire, Copperply is pre-packaged by National-Standard in 4-lb coils for sale by the Ideal Reel Company, Paducah, Ky., with its Ideal Tie Wire Reel.

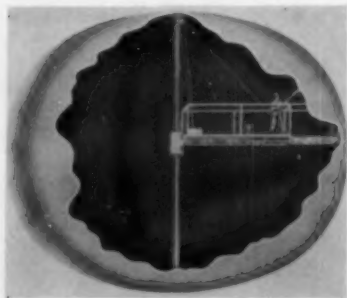
Copperply tie wire used in conjunction with the reel permits up to 25 per cent more ties per man-hour than pulling wire from a loose coil.



## Dirt Pick-Up

**F-33** Handling Devices Company, Inc., 34 Concord Lane, Cambridge 38, Mass. has announced Sweepcart, a new tool for dirt or trash pick-up and removal which eliminates shoveling and simplifies floor cleaning.

Push Sweepcart right up to the pile of trash to be removed. Quickly and easily sweep the material right into the dirt pan and wheel to disposal area.



## Sphere Scaffold

**F-34** Atlas Industrial Corp., 849 39th Street, Brooklyn 32, N. Y., has announced a new scaffold designed for working inside spheres. The requirement for this type of scaffold is the installation of a uniform diameter length of tubing from top to bottom of the sphere and a revolving ring to which a snatch block is attached. The balance of the equipment is entirely removable from within the tank and can be raised or lowered either by hand, electrically or by air.



Making dry ice at 109° below zero using standard ammonia compressors in an improved cycle.



## ENGINEERS

WILL DESIGN . . . BUILD and INSTALL FRICK SYSTEMS . . .

*to solve your most difficult cooling problems.*

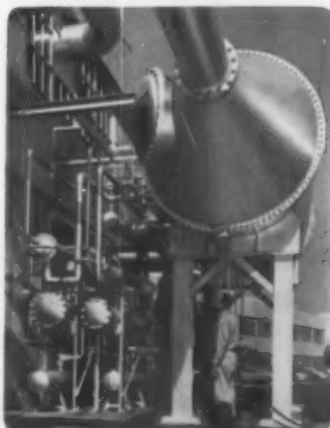
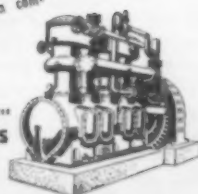
If you need any type of industrial or commercial cooling—for quick freezing, cold storage, ice making, humidity control, low temperatures, condensing, air conditioning, or any process work—contact the nearest Frick Branch or Distributor for recommendations and estimates.

DEPENDABLE REFRIGERATION SINCE 1862  
**FRICK CO.**  
WAYNESBORO, PENNA., U. S. A.



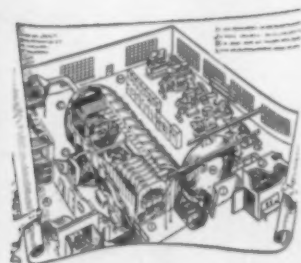
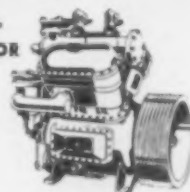
Test laboratory work for temperatures down to 140° below zero.

## "HEAVY DUTY" COMPRESSORS



Cooling air under pressure for supersonic speed tests.

## "ECLIPSE" COMPRESSOR



All-weather Laboratory built for U. S. Army. Uses 3-Stage compressors, maintains Arctic, tropic and stratospheric conditions.

## New Maintenance Product Briefs (Continued)

### Shot Cleaning

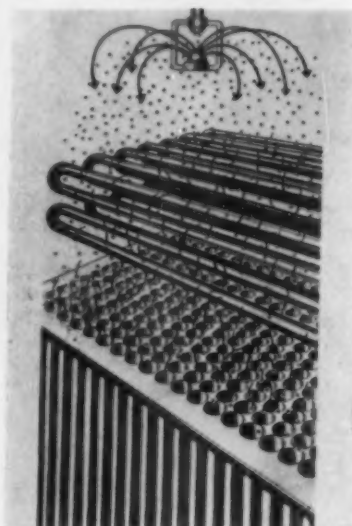
F-35

The Shot Cleaning System, offered by **Diamond Power Specialty Corp.**, Lancaster, Ohio, cascades irregularly shaped steel shot through tubular air heaters and over horizontal surfaces such as superheaters, economizers and reheaters, to remove ash and soot.

The shot dropping by the thousands are evenly spread by distributors. They cascade and ricochet uniformly over the horizontal tubes or through air heater vertical tubes, removing deposits in small particles. Most of the ash is carried away by the gas stream. Heavier particles fall into the hopper and recirculate with the shot until broken fine enough to pass out with the gases.

Areas which tend to foul rapidly can be kept completely clean by increasing the length of the automatic shot cycle (continuously if necessary) without disturbing boiler operation.

The same quantity of shot will clean the entire vertical section with no limitations on height. Shot is



collected in a hopper in the base of the section, then pneumatically lifted to the disengaging tank and storage area. From there it drops through down lines and through retarder boxes to the distributors.



Users report savings on operating costs when **BROOK A.C. MOTORS** furnish power for compressors, pumps, conveyors and machinery in factories, mills and mines. Brook Motors require less maintenance. There is no finer motor built, yet they cost less. All standard enclosures, including NEMA Rerates. 1 to 600 H. P. Warehouse stocks, factory representatives and dealers coast-to-coast. Send for literature.



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### Spill Proof Dispenser

F-36

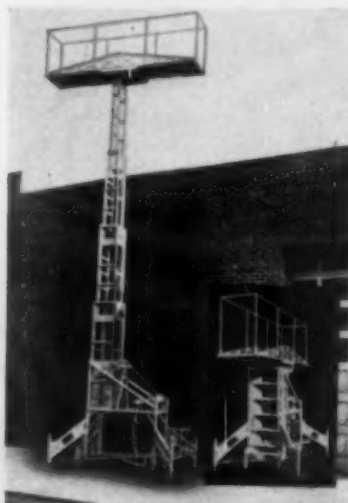
A new dispenser which will produce either a squirt or a stream of oil (or other liquid) by merely squeezing the plastic container, is now available from **Hunter Tool Co.**, Box 564, Whittier, Calif. No moving parts to wear out or break down. Available in 4 or 8 oz. sizes with straight or angle nozzles, each dispenser has a screw on the cap that seals the product and makes it completely leak and spill proof. Once sealed the dispenser can be carried anywhere without worry of leakage. Since the dispenser is fabricated from plastic the user has a visual control of the contents and a break-proof container.

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### All-Purpose Scaffold

F-37

**Atlas Industrial Corp.**, 849 39th Street, Brooklyn, N. Y., announces the introduction of the new All-Purpose Scaffold for spot and area maintenance. It comes completely ready for work — no erection required, no loose parts. It is furnished with a small platform railing for spot maintenance, and a large platform and railing for area maintenance. The bolt-on platform with guard rails is removable for easy storage.



It is of all welded steel construction, and is equipped with four swivel casters for turns in close quarters. It has outriggers for stability. The Platform may be built to meet individual requirements and can be raised to any desired height.



## Silicone Grease

**F-62** The development of a new silicone grease for insulator contamination problems has been announced by the Insulator Department, **General Electric Company**, Baltimore, Maryland. This new anti-contaminant grease is available in two convenient forms — Insulgrease, a paste, and Insuljel, a convenient liquid for spray application.

Insuljel, when sprayed on insulator surfaces, provides an excellent coating for the engulfment of industrial and natural contaminants which, when moistened by dew or light rain, lowers electrical withstand characteristics. It quickly sheds water droplets, and it encapsulates contamination particles in a moisture proof seal, eliminating the occurrence of low resistance paths for the flow of leakage current.

Insuljel contains the silicone grease, Insulgrease, dispersed in a fast evaporating solvent. This solvent has been carefully selected for rapid drying, non-inflammability, and hot line application.

Among the labor and money saving advantages of Insuljel are the

benefits of hot line application and the convenience of first application without the necessity of removing light to moderate coatings of the contaminants. In addition, it can be reapplied without removing previous contaminant saturated coatings.



**Belt Booster**

**F-63** A new, portable belt booster that is rolled easily into position for horizontal, low incline or 30° incline use and that has unique safety features and a rubber cushioned stabilizer that automatically anchors the conveyor in place once it has been set, is now available from **Harry J. Ferguson Company**, West Avenue, Jenkintown, Pa.

The sturdily constructed unit, known as the "Streamliner, Jr.," has a removable front row roller or wheel feeder section that lifts out to reduce, to a minimum, the risk of injury should hands get in the pinch-point between the belt and feeder section.

## Safety Klik-Stops

**F-64** All sizes of the new Klik-Stop Adjustable Wrench are now available in industrial finish from **Proto Tool Company**, Los Angeles division of Pendleton Tool Industries, Inc. The 4", 6", 8", 10", 12", 16", and 20" Klik-Stops are all equipped with the Golden Knurl, Proto's new locking feature which adds new safety for industrial users by holding exact jaw openings, automatically, when the wrenches are in use. The Klik-Stop device consists of two teeth in the wrench body which mesh with grooves in the spring-loaded knurl, holding set jaw openings from creeping or changing when the wrench is removed temporarily, dropped or knocked against machinery or fittings.



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Finnigan Hot Water Generators are engineered to give you large quantities of hot water for low operating cost. The finest materials, creative skill and quality construction assure efficient performance... "Fabricated by Finnigan" assures quality. Finnigan builds hot water generators to your specifications. Call, wire or write today for complete information with no obligation to you.

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**FLOW-actuated alarm**

**LUBE-LINE ALERT** gives positive protection for valuable compressors, engines, machinery and other equipment using force feed lubrication. Small, compact precision-made FLOW alarm inserts into oil lines near each terminal point.

- Fits any make of lubricator
- Connects electrically to any signal—horn, buzzer, light, whistle, telephone, relay
- Signals LACK OF FLOW through line
- Flow capacities from 1/2 cc to 2 qts/min.
- Handles any viscosity oil or synthetic
- Pressures to 10,000 psi in standard models
- Explosion-proof units available

**FREE** Specification Sheet gives complete details. Write for your copy.

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LOOKING for the  
RIGHT CUTTER  
for those IMPOSSIBLE  
METAL  
CUTTING  
*Jobs!*



Here's the Curtain-Raiser  
to a Quick Solution!



There's a HAND or HYDRAULIC powered PORTER CUTTER to answer your toughest metal-cutting problems — over 100 different cutters, all designed to save you time, labor, and money! Make short work of cutting:

• Bolts • Rods • Screws • Rivets • Wire  
• Chain • Steel Strapping • Soft,  
Medium & Hard Metals & Many Others

**CUT LABOR COSTS  
UP TO 97%**



The famous PORTER CENTER-CUT CUTTER... our most popular tool... is the leading all-around cutter for industrial use! For Free Cutting of Soft and Medium Hard Metals up to  $\frac{3}{4}$ ". Available in 6 sizes.

...and for "PRODUCTION" CUTTING



The PORTER WORK-STATION CUTTER can increase one man's output up to 300% in continuous volume cutting! In 3 sizes — up to  $\frac{1}{4}$ " capacity!

ALSO... for those RUGGED JOBS!

The PORTER HEAVY DUTY CUTTER cuts almost anything in metal up to  $\frac{3}{4}$ " diameter — thanks to its heat-treated, hard-tempered center-cut jaws! Comes in 3 sizes.

Contact your Industrial Distributor... or write for your free catalog with illustrated, detailed descriptions of the versatile PORTER line!

**CUT** up to  $\frac{3}{4}$ " rods w/ HAND OPERATED TOOLS — up to  $1\frac{1}{2}$ " rods and  $2\frac{1}{2}$ " power cable w/ POWER OPERATED TOOLS.



**H. K. PORTER, inc.**

Somerville 43, Mass.

## New Maintenance Product Briefs (Continued)



### Pushbutton Ladder

Now being manufactured by **Holan Corporation**, 4100 W. 150th St., Cleveland 35, Ohio, for use in overhead maintenance is the Series 2600 Manually Operated Hydraulic Ladder which goes up and down by simply push-

ing a button. The control station is located on the mast, but a remote control station can be installed on the upper right side rail for control by a man on the platform.

For more precise spotting, there is a globe-type needle valve with a long handle. The operator can accurately lower the ladder by pulling on the lever.

The rotation crank of the 2600 Ladder is located directly behind the mast for more accurate spotting, easier cranking, and less interference.

Extension and retraction of the fly ladder is through a windlass located on the right side of the ladder. The windlass rotates a steel drum to which a  $\frac{3}{8}$ -inch steel aircraft cable is attached. The cable is wound off one side of the drum as the fly ladder is extended and is wound up on the other side of the drum for retraction.

The ladder has an electric-motor-hydraulic pump-reservoir unit for raising and lowering. Maximum operating pressure is 1200 psi. Three models are for 24, 28, or 32-foot ground-to-platform heights. On all units, there is 360° rotation and 75° elevation.

### Bearing Aluminum Bars

Bearing aluminum bars for the multi-purpose use of industry in original installation and in maintenance have been made available by **The Bunting Brass and Bronze Company**, Toledo, Ohio.

The new bar, which can be machined to fit any bearing use, is an aluminum-tin alloy with certain other metals such as copper, nickel and magnesium added to assure the finest bearing properties.

For More Free Data FILL IN CODE NO. on the Handy Return Card — Page 89

### Pulley Lagging

A more practical and economical way to rubber-lag conveyor pulleys has been developed by **General Splice Corporation**, 85 Spring St., South Norwalk, Connecticut.

In the new Minet lagging method, pulleys can be lagged without removal from the conveyor, saving ex-

pense and costly down time. A wear, acid, heat and water resistant Neoprene sheet of desired thickness is cold-bonded to the steel surface of the pulley, with an adhesive strength of 3700 psi. No special tools are required and the lagged pulley is ready for service immediately.



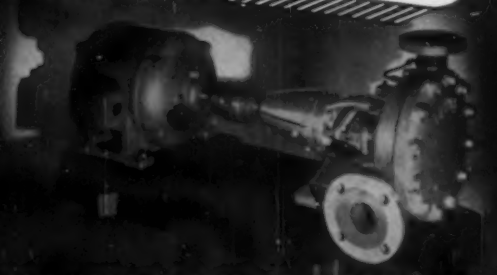
In the absence of bolts or screws, the entire thickness of the lagging is utilized for wear, resulting in longer service life. The danger of damage to the conveyor belt from steel screws coming loose or exposed in a worn lagging, is eliminated. Lagging Kits, containing all material needed, are available for every pulley size.

BUY FLEXIBLE COUPLED

# LEWIS

CENTRIFUGAL  
PUMPS

BULLETIN 131



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Write for complete information in Bulletin PF-1150, available free on request to Industrial Capacitor Division, Sprague Electric Company, 49 Marshall Street, North Adams, Massachusetts.

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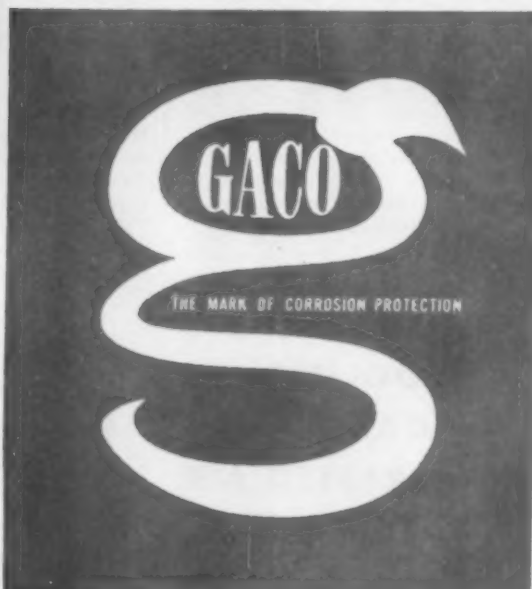
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Bright fast colors, air cure, high tensile, and greater hiding power feature GACO formulations of Hypalon, the new duPont synthetic rubber with superior corrosion resistance. GACO Hypalon coatings are unaffected by ozone, have unusual weather and abrasion resistance, and are suitable for continued use at elevated temperature. Wide choice of color with no sacrifice in other physical properties open new areas of application for GACO Hypalon coatings. Write for details.



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LTD., BRANTFORD, ONTARIO.

## New Maintenance Product Briefs (Continued)

### Floor Topping

**F-41** A brand new floor topping, trade named Duratrem, has been introduced by The Tremco Manufacturing Company, 8701 Kinsman Rd., Cleveland 4, Ohio. This new heavy duty flooring has exceptional resistance to solvents and chemicals — withstands heavy trucking, has an attractive non-slip finish and is light gray in color.

Duratrem is designed to meet the challenge of tough flooring problems presented in food processing industries, canneries, dairies, breweries, bottling plants, chemical and petroleum industries. Or, wherever manufacturing conditions present difficult flooring problems such as: spillage of mild organic acids, alkalis, hot water, grease and oils. Duratrem is easy to apply, can be feather edged, requires no compacting and normally no primers are needed. Light traffic is permitted after only twelve hours or heavy traffic after 24 hours.



### Cleaning Gun

**F-42** A new industrial cleaning and degreasing gun, the Model 361, has been introduced by the Binks Manufacturing Company, 3122 Carroll Ave., Chicago, Ill.

The cleaning gun will satisfy all cleaning booth requirements where varsol, kerosene, naphtha, and similar industrial cleaning solvents are used.

Versatility is increased by the addition of a 45-degree angle ten-inch extension. The gun may also be had in the straight ten-inch extension, if desired. A trigger control operates both the air and cleaning fluid, and the gun will operate with a pressure tank or by gravity feed. Conversion of current Model 36

guns to Model 361 can be accomplished by installing a Binks 56-742 nozzle and 56-744 needle on a Model 36.

### Portable Wire Reel

**F-43** The new "Kinkfree" Portable Wire Reel, designed by LaRaus Manufacturing Company, Inc., Le Roy, New York, permits Romex and other wire to be pulled from the manufacturer's reel kink-free.

The most commonly used electrical wires come coiled, in cardboard cartons, and are pulled through a hole in the carton from the center of the coil.

The Kinkfree Portable Wire Reel is a steel box with a free-action ball-bearing turntable on which the coil is placed. The wire is pulled from the outside of the coil through a guide in the side of the box.

### Step Ladder

**F-44** Folding aluminum ladders from Ballymore Co., West Chester, Pa. offer the user maximum benefits in convenience, compactness, useability and safety.

Handrails are available on 3, 4, and 5-step models. Two, 3, and 4-step models are available without handrails.

A unique folding mechanism locks these lightweight ladders securely at base to make them rigid and stable when in use. A quick lifting motion folds ladders to a compact 10 inches to occupy minimum storage space. These ladders will not rust or tarnish. Extruded aluminum steps, an exclusive Ballymore feature, provide a sure grip, are strong and easily cleaned.

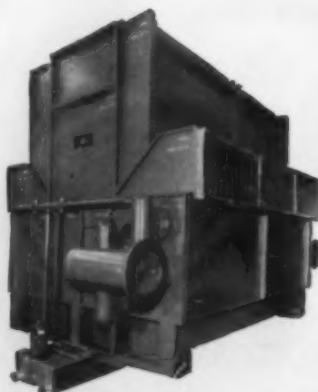
### Anti-Seize Sealant

**F-45** A new Led-Plate Anti-Seize Sealing Compound, No. 250 "F" with filler added, is offered by Armit Laboratories, 6609 Broad St., Los Angeles, Calif. The compound stops spiral leaks from large diameter threads and coarse fittings and stops leaks in welded flanges that have become oval or distorted. Especially good for clean-out plugs. For extremely high temperatures (—350 F to 2987 F) and pressures (50,000 psi hydraulic).

## ECONOMICAL COOLING OF GASES AND COMPRESSED AIR

Cooling gases or cooling and removing moisture from compressed air, the Niagara Aero After Cooler offers the most economical and trustworthy method. Cooling by evaporation in a closed system, it brings the gas or compressed air to a point below the ambient temperature, effectively preventing further condensation of moisture in the air lines. It is a self-contained system, independent of any large cooling water supply, solving the problems of water supply and disposal.

Cooling-water savings and power-cost savings in operation return your



equipment costs in less than two years. New sectional design reduces the first cost, saves you much money in freight, installation labor and upkeep. Niagara Aero After Cooler systems have proven most successful in large plant power and process installations and in air and gas liquefaction applications.

Write for Descriptive Bulletin 130.

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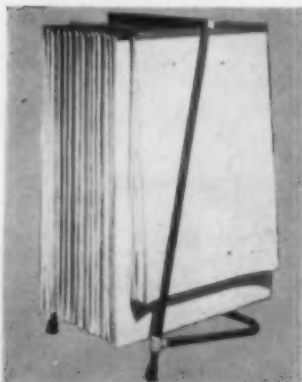
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Dancer "Stikfile" binders and cabinets are available through your local office equipment and blueprint supply dealer or the manufacturer. Write for full information. No obligation, of course.

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## Vibration Recorder

F-46

A new, highly accurate mechanically operated instrument which magnifies and permanently records frequency, amplitude, and wave form of vibrations and other mechanical motions has been announced by **The Korfund Company, Inc.**, 48-48G 32nd Place, Long Island City 1, N. Y.

Designated the Korfund Hand Vibrograph, this compact, lightweight (less than 5 lbs) but ruggedly built instrument is the only such apparatus available with both ink and waxed paper recording (uses 1" wide tape), and a tape take-up reel for convenient storing of readings. It is also the only such meter with variable tape speed to simplify reading of high frequency recording.



This instrument provides a permanent record of the vibration amplitude at the time of installation. Comparing the vibration readings on tapes taken at regular intervals, with this original tape, establishes the amount of wear in bearings or cutting tools, indicating when replacement will be necessary, before breakdown.

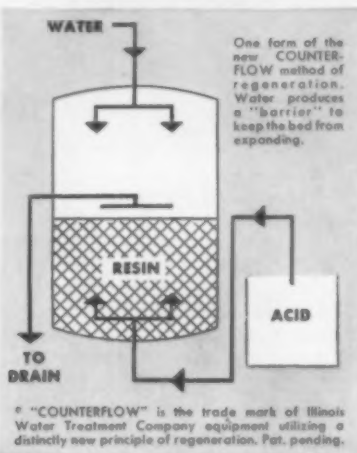
The Vibrograph can also be used to measure rpm of rotating equipment where shafts or rotors are not readily accessible by simply placing its probe against the machine housing. In addition, it aids in balancing equipment, permits measurement of disturbance within a structure, and can be used as a read-out for differential analyzers having straight-line motion output.

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**ionXchange**

## COUNTERFLOW\* REGENERATION OF ION-EXCHANGERS



"COUNTERFLOW" is a method whereby upward regeneration, which has long been recognized as most desirable, is successfully accomplished by establishing a "barrier" at the resin face.

## LOOK AT THESE RESULTS!

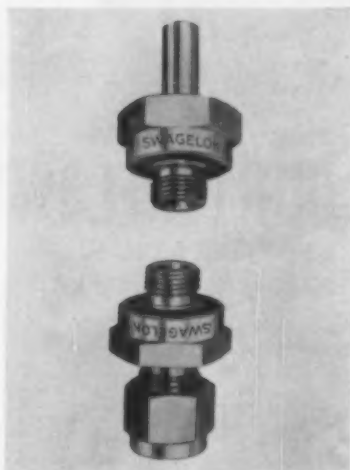
- De-ionizer in a power plant. Conductivity of effluent improved from 10 micromhos to 4 micromhos after conversion to COUNTERFLOW. Cation leakage, expected at 4 ppm with downflow regeneration, actually is only 1 ppm.
- Chemical company in Middle West, 480 ppm TDS in raw water. Expected cation leakage with conventional regeneration, 9 ppm; with COUNTERFLOW, only 1.2 ppm.
- Distillery in Middle West. TDS in raw water, 575 ppm. Expected cation leakage with conventional equipment, 6 ppm; with COUNTERFLOW, is actually only 1.5 ppm.
- Western power plant, converted to COUNTERFLOW. Savings in acid reduction, \$16,000.00 per year. TDS in raw water, 342 ppm. Predicted cation leakage from curves for conventional design equipment, 4 ppm; with COUNTERFLOW, actually only 1.6 ppm.

**ILLCO-WAY**

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NEW YORK OFFICE: 141 E. 44th St., New York 17, N.Y.  
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## New Maintenance Product Briefs (Continued)



### O-Ring Seal Fitting

**F-47** A new type of O-Ring Seal fitting with tapered pipe threads, permitting connection to an existing female pipe thread and securing a positive seal without the use of messy, con-

taminating sealants, is made by **The Crawford Fitting Company**, 884 East 140th Street, Cleveland 10, Ohio.

The O-Ring Seal in this new Swagelok Fitting is built integrally into the body of the fitting. When tightened against its mating surface, the O-Ring Seal eliminates the possibility of the most minute leak. This permits use of the new Swagelok Fitting for pressure connections or high vacuum applications with the most rigid leak-proof requirements.

Designed for use in standard female pipe thread connections, the new Swagelok O-Seal Pipe Thread Male Connectors and Adapters can be installed in a few seconds' time. No counterboring is necessary. No special tools are required. Simple tightening with an ordinary wrench assures a positive, leakproof seal. Available in all machinable metals and plastics in sizes for 1/16" through 1" O.D. tubing.

For More Free Data **FILL IN CODE NO.**  
on the Handy Return Card — Page 89

## Protective Paint

**F-48** An improved line of Rustrem paints that can be used for the preservation of wood as well as metal surfaces has been announced by **Speco, Inc.**, 7308 Associate Ave., Cleveland 9, Ohio.

With the addition of a special fungicide, DDBACC, Rustrem is said to form a tough, attractive finish that protects wood surfaces against rotting, fungus growth, moisture, chemicals, mild acids and fumes. This is reputed to make it ideal for applications where metal and wood are fastened together or come in contact in any way.

Other uses include the coating of machinery, indoors or out; metal buildings, ventilators, furnace mountings, tanks, vats, fire escapes, and steelwork. Standard colors are black, super aluminum with clear base, aluminum with black base, oxide red, oxide green, chrome green, gray and white. Other colors are available upon special request.

Rustrem requires no prime coating and can be brushed or sprayed on, after minimum surface preparation. It is available in 1- and 5-gallon cans and 55-gallon drums.

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Maintenance and Repair of  
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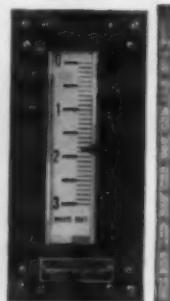
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- For measuring draft, pressure, differential pressure
- Unitized mechanism slips out front of case
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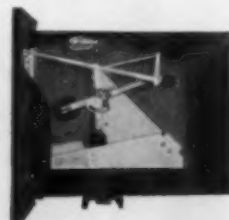
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## ELLISON DRAFT GAGE CO.

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THE ELLISON LINE ALSO INCLUDES:

Draft Gages, Bell and Diafram — Inclined Draft Gages — Portable Inclined Vertical Tube Gages — Vertical Tube Gages — Oil, Heavy Liquid and Mercury — Single and Multi-Tube-Saturator Gages — U Gages, Stationary and Portable — Air Filter Gages, Dial and Inclined Tube Types — Pitot Tubes — U Path Steam Calorimeters — Portable Gas Analyzers—Orsat Type





### Storage Cabinet

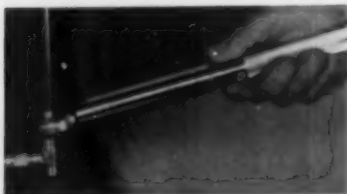
**F-49** Akro-Mils, Inc., Dept. SPI, Box 989, Akron 9, Ohio, specialists in manufacturing small parts storage units has recently perfected an entirely new cabinet which provides combination storage for tools and small parts.

For small parts storage plastic drawers are provided which may be subdivided into 3 compartments each. Seamless steel drawers are provided for tool storage for storing such items as electric drills, drill bits, gauges, calipers, drum sanders and hand tools. Drawer front label slots provide easy indexing of contents.

The frame is made of steel and welded into a sturdy unit which will stand on any level surface or may be hung against the wall. Can be transported easily to and from working area.

### Torque Wrenches

**F-50** A new line of pre-set torque wrenches specially designed for tightening flare nuts, has been developed by the **Skidmore Engineering Company**, 5130 Richmond Road, Bedford Heights, Ohio.



These unique wrenches assure positive, leakproof assemblies and eliminate the problem of awkward,

time consuming fastening so often encountered with the extensions currently used with standard square drive torque wrenches. This is particularly so in close quarters.

There is no need for compensating torque settings as the wrench is pre-set by the manufacturer, sealed, and clearly marked with the set torque. Operation is fool proof. Workers tighten until a distinct snap or "pop" is both heard and felt; this indicates that the correct torque has been reached.

### Deep Hole Drilling

**F-51** Developed by **New England Carbide Tool Co., Inc.**, Medford, Mass., is the Cyclo-Core Drilling Machine employing the I. W. (Inert Weight) method to handle the toughest "deep hole" drilling jobs in hardest concrete, including that which contains large stone aggregate and reinforcing rods.



This machine can drill holes up to 8" in diameter — horizontally or vertically — to depth, depending upon the length of shank. Holes as deep as 5 feet are not uncommon. It can drill holes from floor level to 7 feet high, when set up for horizontal drilling. A chain mechanism on carrier raises and lowers the power unit, for vertical drilling — and power unit is removed from carriage and easily mounted on a vertical traveling carriage for horizontal drilling.

Power is efficiently provided by a heavy duty gear reduction unit — driven by a 1 or 1½ hp single phase electric motor mounted on a round column with rack and pinion feed.

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LARGE or SMALL

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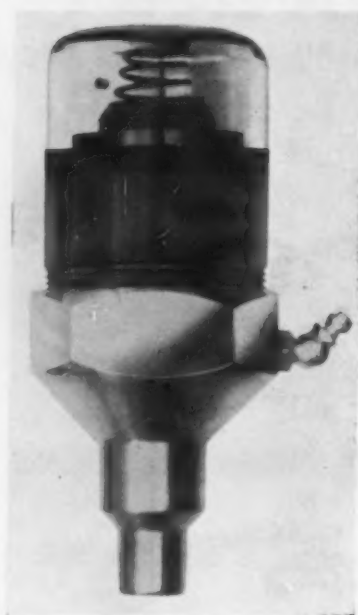


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in all areas

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The  
**WEBSTER ENGINEERING**  
Company  
Box 5246, Tulsa, Oklahoma

## New Maintenance Product Briefs (Continued)



### Automatic Grease Cup

**F-52** Automatic self-feeding lubrication with visible control is now possible for all plain or anti-friction bearings with new Lubrimatic Grease Cups, manufactured by **Lubriquipment Engineers, Inc.**, Box 9194, Fort Worth 7, Tex.

Grease Cups feature a larger, 4-ounce lubricant reservoir; vented clear, unbreakable plastic cylinder for easy view of lubricant supply; spring and weighted plunger to feed grease to bearing with predetermined pressure; a protective valve that seats when cup is full, preventing grease from entering bearing; octagonal chrome-plated metal housing for easy installation; down-pressure grease gun fitting to eliminate possibility of bending or breaking cups off while filling; and internal  $\frac{1}{4}$ " pipe threads in housing so that any size pipe or extension can be used to mount cup.

The Lubrimatic Grease Cup has a clear plastic, unbreakable cylinder that enables the maintenance man to see the amount of grease in the reservoir at all times. This eliminates the guesswork of when and how much to grease, thereby conserving valuable maintenance man-hours as grease is applied only when absolutely necessary.

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### Wood Preservative Paint

**F-53** A new wood preservative paint is announced by **Speco, Inc.**, 7308 Associate Ave., Cleveland 9, Ohio.

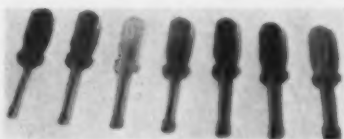
Offered under the tradename, Wood-Rem (wood remedy), it provides maximum resistance to rot and decay and is especially adapted for wood buried in the ground, laid on the earth's surface or subjected to continuous moisture.

Upon application, by brush, dip or spray, Wood-Rem penetrates deeply into wood pores and seals out dampness. Because of its creosote content, it is claimed to kill wood-destroying bacteria.

Wood-Rem is available in standard black and aluminum in 1 and 5-gallon cans and in 55-gallon drums. However, it can be furnished in practically any color on special order.

### Nut Drivers

**F-54** Hunter Tool Co., Box 564, Whittier, Calif. has released a new line of nut drivers featuring a hex shaped head. The new line, which Hunter broaches out of both solid and hollow stock, contains color coded handles. This "in-



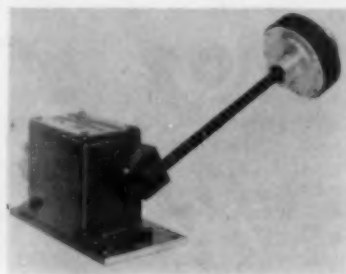
side-out" hex head is the first offered, and its unique design makes it possible to get into tight places that are normally inaccessible with standard nut drivers. Each nut driver is hot broached, polished and bright nickel plated. Handles are break-proof and shockproof. Available in individual sizes or in kits, also stubby and long models, sizes  $\frac{3}{16}$  through  $\frac{1}{2}$ ".

### Conveyor Belt Control

**F-65** A new type load and motion sensor to start, stop or control sequencing of automatic conveyorized operations has been developed by **The Johnson-March Corp.**, Philadelphia, Pa. The

new unit, called Sentron, will signal any combination of conditions involving load or no-load, motion or no-motion of a conveyor belt.

The control housing of the Sentron is cast iron with a gasketed cover, providing a dust-tight, weather-proof enclosure. An actuating arm, of telescoping stainless steel tubing, extends from the control housing, supporting a freely rotating motion sensing element in a wheel housing. This wheel contains a normally open magnetic switch. Movement of the conveyor belt rotates the wheel, thus closing the switch through magnetic action.



The wheel is held against the under-side of the belt under tension. Any load on the belt sufficient to deflect it by as little as  $\frac{1}{16}$ " will actuate the micro-switch in the control housing. In this way both load and motion are detected and utilized to control other equipment.



### Non-Stick Plug Valve

**F-66** A new valve — field tested severely up to 15,000 psi — is stronger and 40% lighter than conventional tapered plug valves, needs approximately 50% less turning force, can be overhauled in the lines, and can be used in lubricated or non-lubricated service. These benefits were announced by **Hamer Valves, Inc.**, Box 1851, Long Beach 1, Calif. for its new Series "D" Plug Valves.





No. 180

**OPW JORDAN**  
self-operating  
temperature  
control valve

with the sliding  
gate and plate

the different  
and improved  
way to control  
temperature

- MORE ACCURATE REGULATION
- GUARANTEED DEAD END SHUT-OFF
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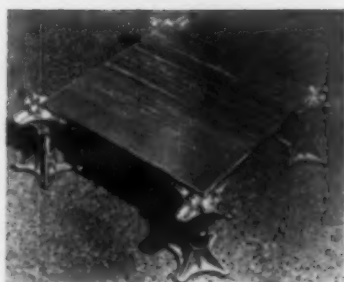
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136 Liberty St., New York 6, N. Y.

Ask for pamphlet BW



### Floating Floors

**F-55** A simplified version of the "raised floor" introduced last year has been developed by **Floating Floors, Inc.**, New York, N. Y. The new version features lower cost, reduced noise and vibration, infinite access, and greater subfloor area despite lower overall height.

The original consisted of individual die-cast aluminum floor plates resting on steel frames that locked onto pedestal heads. Now the steel frames are no longer necessary; only the pedestals and floor plates remain.

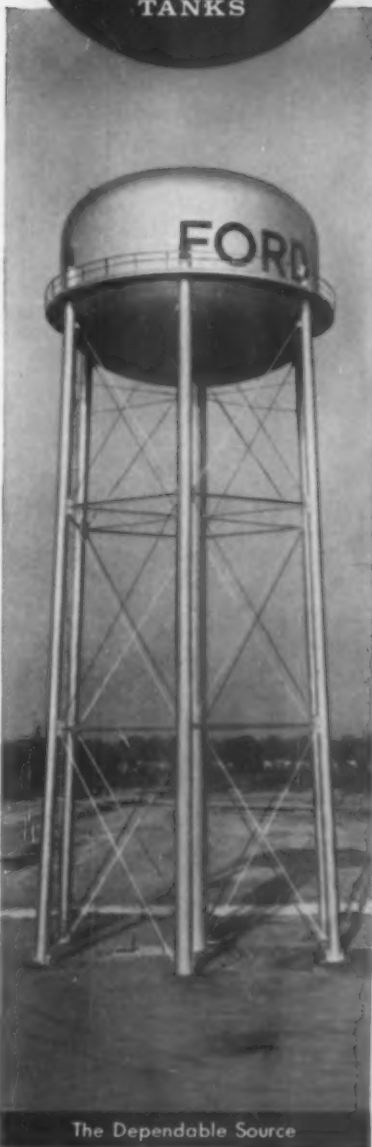
As a result, assembling or taking up the floor is easier and faster and access to the subfloor area is virtually unlimited. Without the steel frames the Floating Floor can also be lower, while at the same time the free area beneath the floor is greater.

### Self-Fluxing Solder Alloy for Magnesium

**F-56** A very low melting solder-type alloy that can be used without separate flux on magnesium is now available from **Eutectic Welding Alloys Corp.**, 40-40 172nd St., Flushing 58, N. Y.

The unique lead-free chemistry of the alloy, EutecRod 1909, is so formulated that it begins melting at only 350 F — well below the transformation temperature of heat treated magnesium alloys.

Primarily the alloy is for building-up, filling and sealing castings, wrought forms and extruded shapes. Complex casting with imperfections can be salvaged at very low cost. Secondly, EutecRod 1909 will also effectively join aluminum to itself or to other metals when the correct Eutector Flux is employed. For aluminum only, Eutector Flux 1909 is recommended. For joining aluminum to copper and steel alloys, Eutector Flux 1909B is available.



The Dependable Source

**GRAVER TANK & MFG. CO.**

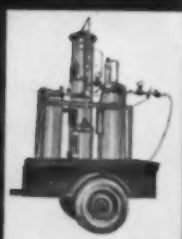
DIVISION—UNION TANK CAR COMPANY

EAST CHICAGO, IND.

Plants and Offices Across America

for Elevated Water Tanks

**WATER  
SOFTENING  
AND  
CONDITIONING  
IS OUR  
BUSINESS**



MOBILE UNIT DESIGNED FOR THE UNIVERSITY OF FLORIDA

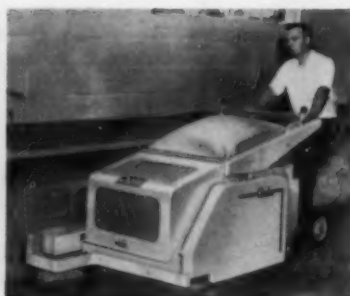
Above is a unique, mobile, combination water softener and Deionizer.

One of the many softeners and conditioners designed and manufactured by Southern Water Conditioning, Inc. For further data, specifications, bids, or surveys, write to Southern Water Conditioning, Inc., 301-15th Ave. So., St. Petersburg, Fla.

All types of Domestic, Commercial and Industrial Water Softening and Conditioning Equipment: Filters - Taste & Odor Removers - Aerators - Demineralizers - Zeolite Ion Exchange minerals in stock - Residential & Commercial Package Swimming Pool Filters - Rebuilding and modernizing.



**Southern Water Conditioning, Inc.**  
301 15th Avenue South  
St. Petersburg, Florida



## Power Sweepers

**F-57**

The first two models of a new line of power sweepers designed to drastically reduce sweeping costs have been introduced by **Clarke Floor Machine Company**, 30 E. Clay Ave., Muskegon, Michigan.

These sweepers have been designed and built to do the work of about 20 men and cut sweeping costs about 80 per cent. They sweep cleaner, faster and more dust-free than any other sweeping method, pick up all types of debris, operate easily in congested areas or large, open spaces, both inside or outdoors. Model CS-27 sweeps up to 35,000 sq ft per hour and Model CS-36 covers up to 50,000 sq ft.

For More Free Data FILL IN CODE NO. on the Handy Return Card — Page 89

## Maintenance Paint

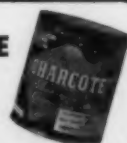
**F-58**

A new line of paints, Dura-wear Maintenance Paint, is being marketed through the **Valdura Division of American-Marietta Company**, 101 East Ontario St., Chicago 11, Ill. Formulated to fill the need for an inexpensive maintenance paint, Durawear has good color and gloss retention, as well as excellent hiding properties.

The new paint features a linseed oil modified alkyd vehicle and has better brushability than straight alkyd enamels. It gives extra protection to surfaces for many years and is easy to paint on irregular surfaces since the consistency prevents running off from sharp corners.

Durawear is recommended for use on steel, wood and masonry surfaces where there is no particular chemical problem. It may be applied indoors or out, on window sash and trim, wall surfaces, storage tanks and wherever protection from weathering is desired. It is available in red, gray, black and two shades of green.

**MAINTENANCE  
PROBLEMS  
END WHEN  
YOU USE**



**CHARCOTE**

NEOPRENE RUBBER-COATING

CHARCOTE is not a rubber base paint. You actually rubber-coat surfaces with protection! CHARCOTE air-dries and cures to a tough, pliable, rustproofing and waterproofing film of neoprene rubber, and has its built-in primer. Can be brushed, rolled, sprayed or used as a dip. Available in aluminum, red, black, green and grey; in quart, gallon, five-gallon and drum containers.



**Tougher Than The Metal Itself**  
Outstanding Protection Against:  
CORROSIVE FUMES — MOISTURE  
ABRASION — SUNLIGHT & HEAT  
SALT SPRAY — WEATHERING

Write for FREE Charcote Folder  
**CHARLESTON RUBBER CO.**  
50 STARK IND. PARK CHARLESTON, S.C.  
JOBBER INQUIRIES INVITED

**REMEMBER**



pack more  
performance  
into every  
application

**GET THEM** at any industrial distributor authorized to carry Palmetto Packings. For the name of a supply house near you consult our insert in Thomas Register—between pages 4816-4817.

**GREENE, TWEED & CO.**  
North Wales • Pennsylvania



## PIPE—All Your Needs

For the fastest service on ANY pipe order—especially for the unusual or hard-to-get sizes . . . make just one call to your nearest Foster office. Tested and structural stocks, 1/8" to 48", all walls and all specs for every purpose. Also valves and fittings from warehouse stocks. Send for free catalogs and ordering guides.

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## New Maintenance Product Briefs (Continued)

### Dry Film Lubricant

**F-59** A non-inflammable colloidal graphite lubricant designated as a dry film material packaged in a giant economy-size industrial aerosol has been announced by **Miracle Power Products Corp.**, 1101 Belt Line St., Cleveland 9, Ohio. Called "dof 123," the colloidal graphite is carried in a 0.7% concentration at 34 to 38 psi (room temperature) in an instantly-drying Fluron propellant. Control elements carried with the synthetic colloidal graphite provide both an even dispersion during application, and a high affinity for all clean, dry metal surfaces on contact.



Uses of "dof 123" include application to prevent dry rubbing contact during initial movement of bearing surfaces, and during subsequent run-in. Reported to lower interfacial tensions with oils, the dry graphite film causes frictional surfaces to retain thicker oil films. This wetting agent characteristic helps to distribute protective oil films to hard-to-reach areas and to hold them on the treated surfaces.

### Insulation Tester

**F-60** Step voltage tests on equipment in the range of 300, 600, and 2500 volt classes are now possible with the Megger Insulation Tester, manufactured by **James G. Biddle Co.**, 1316 Arch St., Philadelphia 7, Pa.

Recent electrical maintenance practices indicate the value of testing insulation with d-c voltages at levels somewhat higher than the peak value of the rated a-c voltage

of the equipment being tested. The technique involves the application of two or more d-c voltage and critical observation of any reduction of insulation resistance at the higher voltage. Marked reductions for prescribed increase of applied voltage indicate an incipient weakness.



Excellent voltage regulation characteristics and high sensitivity are particular features of the instrument. The 6 output voltages, 500, 750, 1000, 1500, 2000, and 2500 volts with a range of 0-10,000 megohms and a single easy to read scale,

plus a plug-in rectifier-operated generator, provide a convenient means for using the advanced techniques.

### Repair Kit

**F-61** The Hysol Epoxy Patch Kit 6C has been developed by the **Houghton Laboratories** of Olean, New York for easy, economical, and permanent repairs of tools, castings, and heavy machinery. It is strong enough to assure perfect repair for both ferrous and non-ferrous metal castings, plastics, or fittings on vacuum vessels.

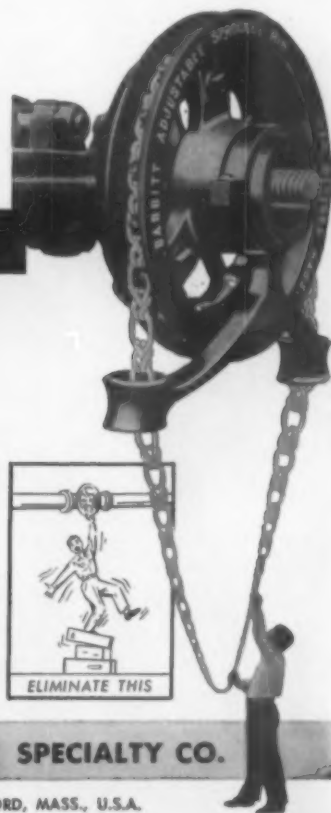
The 6C Kit contains two flexible tubes, one of base resin, the other of hardener. Mixing requires only that an equal length bead be squeezed from each tube, giving a smooth, no-flow material ready for room temperature use. Complete hardening will occur in one to two hours, but can be accelerated by the application of low heat. Waste is eliminated and repairs can be made in place. Production parts are salvaged inexpensively and costly old style methods of repair become obsolete.

715-7

## Safe Operation Of OVERHEAD VALVES

with a  
**Babbitt**  
Adjustable  
**SPROCKET RIM**  
with Chain Guide

- Simplifies pipe layout
- Fits any size valve wheel
- Easy to install and operate
- Operates any valve from plant floor
- Time and money saving fixture
- No maintenance; first cost only cost
- Packed, completely assembled, one to a carton
- Hot galvanized, rust-proof chain available for all sizes
- Easy to follow instructions with each unit
- Your supplier carries complete stocks
- Write for new descriptive catalog sheet and prices



**Babbitt** STEAM SPECIALTY CO.

3 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

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Planning that looked far ahead

## P. LORILLARD COMPANY'S award-winning plant



This plant covering over 600,000 sq. ft. produces famous Old Gold, Kent and Newport cigarettes in a completely automated process. Its most modern "climate control" involves refrigeration capacity equal to 120,000,000 lbs. of ice per year.

### equipped throughout with **JENKINS VALVES**

One of the ten "Top Plants of 1956\*", the Lorillard plant at Greensboro, N. C. is notable from any standpoint but especially for planning that looked far ahead.

You see it everywhere. In exterior surfaces of brick, aluminum and marble that need almost no maintenance. In walls of glazed tile and floors that are concrete or hard surfaced to reduce cleaning.

You see it in the standardization on Jenkins Valves to assure that costly valve maintenance and replacement will not develop in future years.

To plant and building owners and the experienced men who design and construct for them, the specification "JENKINS" has been an unquestionable assurance for almost a century. You will want to have this assurance of long, trouble-free service when you specify or install valves, especially since Jenkins Valves cost no more. Jenkins Bros., 100 Park Ave., New York 17.

*Sold Through Leading Distributors Everywhere*

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LOCKWOOD GREENE ENGINEERS INC., New York, N. Y.

*General Contractor:*

H. L. COBLE CONSTRUCTION COMPANY, Greensboro, N. C.

*Air-conditioning Contractor:*

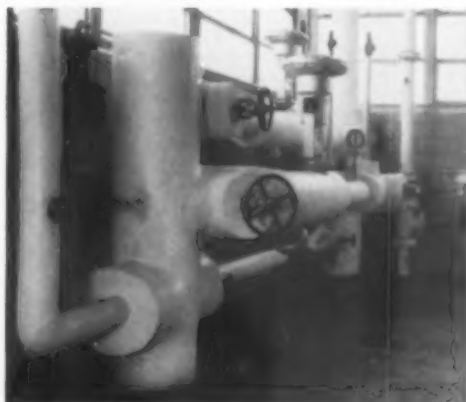
BUENSO-STACEY, INC., New York, N. Y.

*Piping Contractor:*

GRINNELL COMPANY, Charlotte, N. C.

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DIXON & CHRISTOPHER, INC., Greensboro, N. C.



Jenkins bronze, iron, cast steel and stainless steel valves are standard in this modern plant. Shown is a typical installation on the main water supply line.

# JENKINS

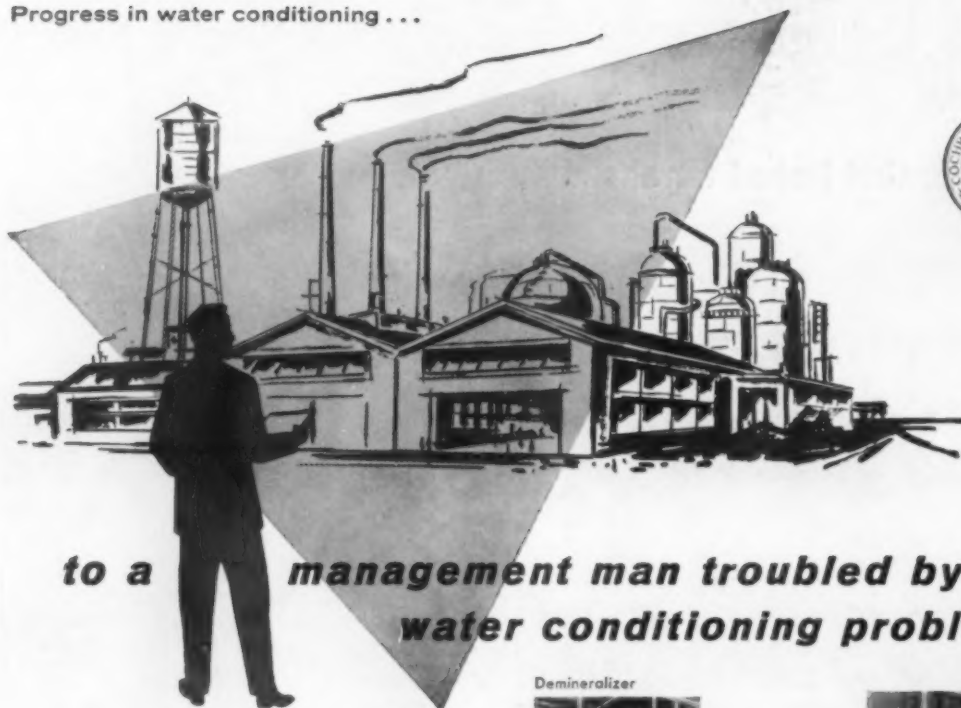
LOOK FOR THE JENKINS DIAMOND

# VALVES



\*As selected by a leading business publication

Progress in water conditioning . . .



**to a management man troubled by water conditioning problems . . .**



Hot Process Softener

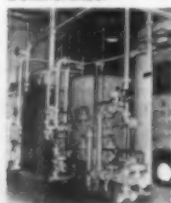


Reactor

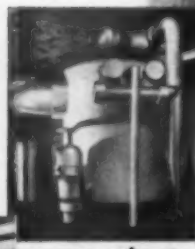


Zeolite Softener

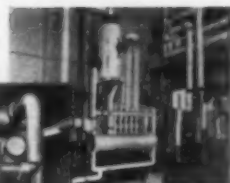
Demineralizer



Multiport Relief Valve



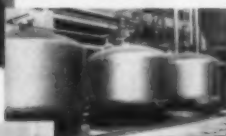
Deaerator



Continuous Blow-Off



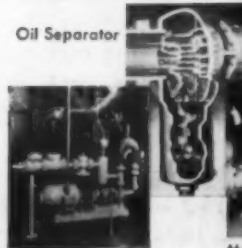
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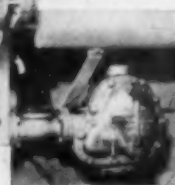
Filter



Steam Purifier



C-B System



Multiport Drainer

Is your plant's water treatment system overloaded by new boilers, turbines or process equipment? Can your product be improved or made more uniform by higher quality water? Sometimes the only answer is to install a complete new system, but in many industrial plants Cochrane has been able to find far less costly solutions utilizing present equipment.

Cochrane is in a unique position to assist your staff in analyzing all approaches to your problem and selecting the most economical one. Its experience in water and heat engineering covers nearly a century and every industry from steel to pharmaceuticals and atomic power. Cochrane manufactures all types of water treatment equipment, assuring you of an unbiased recommendation. A Cochrane representative will be glad to discuss your problem with you or your staff. There is no obligation, simply call or write: Water Treatment Division.

## **Cochrane CORPORATION**

3110 N. 17th Street, Philadelphia 32, Pa.

Philadelphia • New York • Chicago

Cochrane Water Conditioning, Limited, Toronto, Montreal, Winnipeg, Canada

Representatives in thirty-two principal cities in U.S., Hawaii, Puerto Rico; also Havana, Cuba; Paris, France; La Spezia, Italy; Mexico City, Mexico; Caracas, Venezuela; Santiago, Chile; Manila, Philippine Islands.

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Custom built carbon steel and alloy products.

